

VETIVERIM

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Editorial

Vetiver Hedges vs Hedgerows

In the website, <vetiver-system@googlegroups.com>, there have been some hot discussions on the use of the terms 'hedge' and 'hedgerow', which are used interchangeably in vetiver literature. It all started out when Henry Green of TVNI <greenhd@comcast.net> advised Alberto Rodriguez of Agriflora <alrod312@gmail.com> to avoid using 'hedgerows', as they are rows of bushes, shrubs, etc. He proposed the best term for VS is 'hedges'. This was opposed by Dick Grimshaw of TVNI who cited the dictionary that 'hedges' are barriers and include barriers of turf and stone; vetiver grass is another such barrier, and vetiver 'hedgerows' remain good nomenclature. Alberto, on the other hand, argued that 'hedgerow', as given in Merriam Webster dictionary, is "a row of shrubs or trees enclosing or separating fields", while that for 'hedge' is, "a fence or boundary formed by a dense row of shrubs and low trees". However, a few other people have different ideas and there seems to be no final agreement among the vetiverites. For example, Alberto even stated that 'I don't think that I want to eradicate all the hedgerows and replanting them with hedges, but 'hedge' does seem like the strongest term, while Mary Wilkovski of the Vetiver Systems Hawaii LLC <maw808@aol.com> noted that, "I too, have wondered about the distinction between 'hedge' and 'hedgerow'. I prefer 'hedge' simply because it's more familiar".

The Editor himself, in his book, "Vibrant Versatile Vetiver", used the term 'hedgerow' to mean "a row of closely-spaced plants forming a line". He also quoted <www.dictionnaire.com> as stating that it is "a row of shrubs or trees planted for enclosure, or separation of fields" or "a fence formed by a row of closely planted shrubs or bushes".

Whatever the real meanings of the two terms are, it should be noted that the effectiveness in erosion protection of the vetiver plants lies in the fact that they are grown close together, forming a single tightly-spaced row. Such a hedgerow forms a barrier for debris to pass through, thus accumulating the sediment in front of the hedgerow. The hedgerow also reduces the speed of runoff water, spreading it out and slowing it down, giving it a chance to soak into the ground, increasing the soil's moisture content before oozing the hedge and moving on down the slope. *The Editor welcomes comments on these two terms from the readers of Vetiverim before we can choose which term for future use.*

Stabilize Soil with Vetiver Grass*

"The key points are we must have water to drink, to use and to support agriculture, since life is there. If there is water, people can live. If there is no electricity, people can live. But if there is electricity but no water, people can't live," says His Majesty King Bhumibol Adulyadej of Thailand. In response to this important message, more than 400 high school students from 20 schools nationwide participated in the first Junior Water Challenge in October 2008. The contest is for the elder students to lead the younger ones to conserve water resources by applying His Majesty the King's initiatives. His Majesty has been an ardent supporter of Vetiver Technology for about 20 years, and recognizes vetiver's importance to water conservation.

The project is a collaborative effort by the Coca-Cola Foundation, the National Council on Social Welfare of Thailand, the Hydro and Agro Informatics Institute, the Royal Irrigation Department, the Ministry of Education, and the Office of the Royal Development Projects Board. It aims to educate students on, and raise their awareness of, sustainable water management and conservation. Each participating school has to generate its own water conservation project. The campaign does not only ask students to conduct their projects within their own schools, but also encourages them to build water conservation networks in their community and nearby schools. The final round was held at Khao Hin Son Development Study Center in Chachoengsao province, from 8 to 10 October 2008 and 80 students from the four winning schools in each region took part. At the camp, each group presented an enthralling project and showed their passion and concern over water and environmental issues. One of the projects was on vetiver planting to protect water reservoirs. It is described below:

Students from Huai Yot School in Trang province, the southern region winner, presented its "Vetiver planting on the banks of Huai Yot school's reservoirs according to the Sufficiency Economy Philosophy" project. The project aimed to protect two valuable reservoirs near the school, community's major water sources. During the rainy season, heavy rains usually collapse the reservoirs' banks and reduce the water levels. The water bodies are also contaminated with garbage and rotten leaves. The students planted vetiver grass on the reservoirs' banks, using vetiver's deep thick roots to stabilize the soil and prevent it from collapsing. "We will use the grass for roofing. Also, we intend to produce paper from vetiver grass in the future," said a Huai Yot school student. They also expect that their school will be a vetiver grass distribution center.

Abstract of Published Vetiver Article

Below is the abstract of a paper on vetiver recently published in the journal. The Editor would like to invite the authors of the papers on vetiver which have been published in scientific journals to submit their papers for inclusion in future issues of Vetiverim.

Title: Extraction of *Vetiveria zizanioides* essential oil by supercritical carbon dioxide

Authors: Danh Thai Luu, Raffaella Mammucari, Tam Tran, Neil Foster (School of Chemical Sciences and Engineering, New South Wales University, Australia) and Paul Truong, Veticon Consulting and International Vetiver Network, Brisbane, Australia.

Abstract: The yield of supercritical carbon dioxide extraction (SCE) of essential oil from the roots of *Vetiveria zizanioides* has been optimized with a response surface method with central composite design. Three operating parameters – pressure, temperature, time – were varied over five levels in a dynamic extraction process utilizing carbon dioxide as extracting medium. Analyses of multiple regression indicated that the pressure was the major linear effect on oil yield, whilst temperature and time had a lesser impact on the extraction yields. However, temperature had significant effect in quadratic form and interaction with pressure. At any extraction time, yields significantly increased with increasing pressure and temperature.

* Extracted from Bangkok Post, 4 November 2008, "Students Combine His Majesty the King's philosophy with local knowledge to conserve water sources" by Purich Trivitayakhun; and also from <<http://www.raknam.com>>.

The empirical model predicted SCE yield for operating conditions of 220 bar, 54°C and 40 minutes was compared with the ones obtained by hydro-distillation and extraction with hexane. The predicted SCE yield was over seven times higher than that of hydrodistillation and slightly higher than yield obtained by hexane extraction. Compared to hydrodistillation and extraction with hexane, SCE presented the distinctive advantages of low temperature, low operation cost in terms of time and energy, and producing products free from residual solvent. The high yields and purity of extracts makes SCE an attractive process for the essential oil industry which is under pressure to produce "clean essential oil".

Keywords: Supercritical CO₂ extraction, vetiver oil, response surface method

Published in: Proceeding of 11th European Meeting on Supercritical Fluids, Barcelona, Spain, May 4-7, 2008.

Full paper available from: Proceedings of the 11th European Meeting on Supercritical Fluids, Barcelona, Spain, 4-7 May 2008.

Corresponding author: <n.foster@unsw.edu.au>

News on Vetiver Networks in India

Merging of SIVN with INVN:

As reported in *Vetiverim* 41: 16-17 (April 2007), South India Vetiver Network (SIVN) was established in early 2007, concentrated in Kerala, a small state at the south-west end of the peninsula of India. The officers of SIVN included: P. Haridas as the President, M. Abdul Samad as the Treasurer, and K.R. Indira as the Coordinator. Prior to the First National Workshop on Vetiver System in Cochin, Kerala, in February 2008, it was thought that there should be only one vetiver network in India, and as Rajan R. Ganghi, the Coordinator of the India Vetiver Network (INVN) could not carry on the activity of INVN which was established around 2003, it was decided that SIVN should take over the activity of INVN with P. Haridas as the Coordinator of the new INVN. Details of the present INVN are as follows:

Name of the Network: India Vetiver Network

Acronym: INVN

Coordinator: P. Haridas

Address: Thykkat Pannikot House

P.O. Thiruvalli C 679348

Malappuram District

Kerala State, India

Tel.: 0483-2721168 (R) +91-9447009149 (M)

Email: <pottekadharidas@gmail.com>

Website: www.vetiver.org.in

Establishment of EVNI

Soon after the First National Workshop on Vetiver System in India, Cochin, Kerala, a group of Indian scientists from eastern India established the Eastern Vetiver Network, India (EVNI), with office at Guwahati to work in the eastern states of India (see details in Letters to the Editor in this issue of *Vetiverim*). Details of the EVNI are as follows:

Name of the Network: Eastern Vetiver Network, India

Acronym: EVNI

Coordinator: Shantanoo Bhattacharyya

Address: 148 Rajgarh Road, 3rd Floor

Bhangagarh, Guwahati-781005

Assam, India
Tel.: +91-9957567647
Email: <shantanoo.bhattacharyya@gmail.com>
Website: Under construction

EVNI will function under the guidance and close cooperation of India Vetiver Network (INVN). The Coordinator and another member of INVN will serve on Executive Committee of EVNI.

Madagascar Vetiver Network Produced Its First Newsletter

The Madagascar Vetiver Network (MGVN) has produced its first newsletter. See <http://www.vetiver.org/MAD-NL11_08pdf.pdf>. In the past Madagascar has demonstrated some excellent applications of VS. Presently, Yoann Coppin, the leading Madagascan VS business, of La Plantation Bemasoandro – Vetiver System Applications Madagascar, is developing a network and sharing information.

TVNI Vetiver System Brochure/Poster

The Vetiver Network International (TVNI) has requested the Pacific Rim Netiver Network (PRVN) to publish and distribute a brochure on Vetiver System. It is a full color two-sided (16.5 x 23”) brochure on glossy full weight paper containing 58 images relating to vetiver grass and its applications with descriptive text. The English version can be downloaded from <www.vetiver.org>.

This brochure has proven extremely popular and has been translated into a number of languages including Mandarin, French and Spanish. The two-sided brochure makes an excellent learning aid and can be used as a poster.

The PRVN is pleased to announce that the free copies of the English version of the brochure can be obtained in writing to Suwana Pasiri at <spasiri_2000@yahoo.com>, or by mail at: 78 Rajdamnern Nok Ave., Dusit, Bangkok, Thailand.

Vetiver Workshop to be held in Ethiopia

The National Workshop on the Vetiver System for Soil & Water Conservation, Environmental Protection & Land Rehabilitation will be held in Addis Ababa, Ethiopia from 16 – 18 March 2009. It is organized by the Sustainable Land Use Forum (SLUF) of Ethiopia and the Vetiver Network International (TVNI), with sponsorship by the Swedish International Development Agency (SIDA) and TVNI. The workshop aims to learn about the succesful application of the vetiver system (VS) for soil and water conservation purposes in Ethiopia over the past 13 years and discuss how the VS’s wider applications for disaster mitigation, slope stabilization, water quality improvement, pollution control, and other environmental and social uses might be accelerated in Ethiopia. Workshop resource persons will be drawn from Ethiopian and international experts familiar with the VS. It is expected that there will be some 200 participants. Interested persons from other countries are welcome to attend and should contact <<mailto:dideguda@yahoo.com>> or <<mailto:vetiversystems@comcast.net>>. The organizer expects the final program to be detailed and posted by the end of December 2008.

If you suffer from athlete’s foot, try smearing raw vetiver oil on the infected area. You will never need to use expensive ointments or sprays again. You can buy the oil from Ebay.

Greetings my fellow vetiverites,

I wish you all a joyous season and a successful new year in meeting new challenges – some of which I hope are exciting. Each time that I open our website I get a good deal of comfort from the interactive map that shows the many real time (red dots) hits from visitors in different parts of the world – what better feed back than something simple and visual. There has been a lot of vetiver activity during 2008 – new blogs have been established for:

<http://www.journalontheland.blogspot.com/>>Sardinia Vetiver Network

<http://vetiversenegal.blogspot.com/>>Senegal Vetiver Network

<http://www.vetiversystemshawaii.blogspot.com/>>Vetiver Systems Hawaii

<http://africavetiver.blogspot.com/>>Africa Vetiver

<http://vetiverlatina.blogspot.com/>> Latin America Vetiver Network Vetiver Latina

<http://vetiversolutions.blogspot.com/>>Vetiver Solutions Blog

Thank you all for this input. Blogs are so easy to establish and for some of you can be a “vetiver diary” (or more likely a “soap box”) to be shared with others. It is nice to know that we get many visitors to the blog sites too, even though some people may be looking for vetiver perfumes or the “vetiver band”!

Our <http://groups.google.com/group/vetiver-system>>Vetiver System Google Group , has turned out to be pretty useful, and new ones have been established for:

<http://www.blogger.com/Vetiver%20Caribbean%20Network>> Vetiver Caribbean Network , and

<http://groups.google.com/group/vetiverlatina>>Red Vetiver Latina.

I hope to see more blogs and groups being developed in Africa and Asia. If you are contemplating establishing new ones I suggest you use Google. Google provides easy to use and effective applications.

I started off with reference to these blogs and groups, as well as vetiver websites and Picassa galleries because the internet provides so many opportunities to deliver and exchange information – the only cost being our time. It is these internet activities that account for more than 90% of increased applications of the Vetiver System around the world.

To back up these communication methods, this year we published a new technical manual - *Vetiver System Applications – A Technical Reference Manual* by Paul Truong, Tran Tan Van, and Elise Pinner. This manual has already been translated into Vietnamese, Mandarin, and Swahili; it is also being translated into French and Spanish. The manual is available from:

<blockquote>Amazon.com<a href="http://www.amazon.com/s/ref=nb_ss_gw?url=search-alias%3Daps&

field=Keywords=Veriver+System&x=0&y=0"></blockquote>

and can be downloaded from Esnips (1,500 downloads since June). Also on

<http://www.esnips.com/web/VetiverSystemhandbooks.publishedJune2005>>Esnips

There are a number of useful VS PowerPoint:

<http://www.esnips.com/web/VetiverSystemsPowerPoints>>presentations; it is available for downloading (2,700 downloads thus far). I will be expanding this power point “bank” during the winter.

We started the year with two very well attended workshops in Chandigarh and Kochi (located in north and south India, respectively). The turn out was good, and for two and half days in Kochi we were able to hold the attention of some 300 people. As a result of these workshops vetiver activities in India have increased significantly – The India Vetiver Network (INVN) was formally established under its coordinator P. Haridas. Thank you Haridas for organizing such a well focused gathering in Kochi.. More recently Shantanoo Bhattacharya has established a regional network (linked to INVN) for East India. Both networks have been busy promoting the technology.

Workshops are very powerful tools to bring potential users together, and in every case (going

back since TVNI was established) these workshops (and conferences) have had important impacts on accelerated and widening VS use. We are currently planning two new workshops for March 2009, the first in Nairobi, Kenya (the country of my youth), followed immediately by a large one in Addis Ababa, Ethiopia, that includes a field trip to western Ethiopia, where amongst others we will meet a farmer who has 250 km of vetiver hedgerows on his farm. In both cases we hope that the workshops will expand the use of vetiver into other sectors besides agriculture. During this past year there have been some notable vetiver developments:

Tuon Van of Cambodia has undertaken a large [project](http://www.vetiver.org/CAM_Mekong_Stab/CAM_Mekong%20Stabilization.htm) to stabilize the Mekong River bank on the boundary of his farm. It is not a straight forward job and we are still learning. It is however a great example how almost instantaneously our networking brought together support from Vietnam, Thailand, Australia, and the US. The results thus far have been interesting enough for Shanatanoo Bhattacharya of Assam, India to start a similar river bank stabilization on the massive Brahmaputra River. This one we will follow carefully.

In Madagascar Rokey Noffke of South Africa's Hydromulch, working with Yoann Coppin, has stabilized some impressively large [coastal sand dunes](http://www.vetiver.org/Graphics/Images/MAD-sandunetxt.pdf) to meet the road access needs of a major mining company. An interesting facet of this project was the use of local farmers to propagate the millions of Vetiver plants required for this project. For these farmers Vetiver plant production became a major cash enterprise, earning them more than US\$150,000. This sort of private sector/community approach should be replicated all over the developing world.

In Vanuatu, Don Miller, has [demonstrated](http://www.vetiver.org/VAN_REEF/VAN-reef2.htm) very convincingly how the Vetiver System can be used as an essential component for the rehabilitation of point source erosion sites (in this case major gullies), and the resultant prevention of sediment flow to the nearby coral reefs.

In California, Doug Richardson, who has now some 60 vetiver projects in southern California, continues to [show](http://picasaweb.google.com/VetiverNetwork/CaliforniaApplications#5217055376996261970) how vetiver can be used so effectively to stabilize slopes and prevent landslides on some pretty valuable residential properties.

In Indonesia, Norman Vant Hoff has worked in Aceh (the Tsunami town that got wiped out) establishing individual and community [waste-water treatment](http://www.vetiver-indonesia.com/sanitation.htm) installations.

These are just a few examples of this year's activities. But all over the tropics VS is now being increasingly used to solve environmental and social problems relating to natural resources and their protection.

In December, [Alberto Rodriguez](http://vetiversolutions.blogspot.com/) who is a vetiver supplier in Puerto Rico (and sells amongst other things good quality vetiver on Ebay) represented TVNI at the "Jamaica - Caribbean All-Hazards Conference", and gave a well received presentation on "VS for Disaster Mitigation". As a result there is a new interest in the Caribbean in VS and Alberto has subsequently set up [Vetiver Caribbean Network](http://groups.google.com/group/vetiver_caribbean) (a Google Group forum) and will take the lead in VS promotion in the Caribbean. In the mean time Tim Journey and Henry Green are working with aid agencies (particularly the World Bank) to introduce VS on a wide scale for the rehabilitation of Haiti. Interestingly we received today this comment from an NGO working in Haiti, Mike Mahowald, who writes "I really know that any agricultural project on the mountains of Haiti that doesn't start with vetiver is worthless".

The March 2009 workshop in Ethiopia will provide a great opportunity to see the progress in that country of the expanding VS program for soil and water conservation that started 20 years ago. Debela Dinka - Sustainable Land Use Forum, Ethiopia, writes "According to our partner NGO in Illubabor, Ethio-Wetlands and Natural Resource Association (EWNRA), vetiver technology is more or less being used in 17 districts of 22 in Illubabor. It is estimated that about 17,000

households are using vetiver. It is expected that the remaining 5 districts will be involved. The major impacts of vetiver are decreased rate of soil erosion; increased crop (maize sorghum, vegetables) yield due to soil and water conservation; reduced siltation of wetlands and streams; groundwater recharge which subsequently improved flow of springs, streams and wetlands; survival rate of tree and coffee seedlings reached more than 80%. Other uses of vetiver: mulching in coffee plantations; thatching of houses, stores and shades (vetiver grass gives long time service); mattress making (it repels home fleas and other insects); homestead hedgerows for beautification; making rope; income generation (farmers sell vetiver clumps for planting materials); and the green leaves of vetiver are cut and spread in and around homes during holidays and social gatherings such as wedding ceremonies." The Ethiopian experience brings us back in a full circle – the need for a renewed focus on expanding the use of vetiver for soil and water conservation – essential if developing countries are going to meet their food requirements.

John Greenfield (TVNI Director) writes, "There is little need to trot out the statistics, it is common knowledge that from the point of view of sustainable food production, the developing world has not made it, and is not making it, especially when we look at Africa. Despite all the efforts of the UN's agencies, and numerous other aid agencies, NGOs and private donors over the past 40 years, Africa still cannot feed itself, what is more, the situation is getting worse. This is not through any lack of money, or international conferences on the subject, when aid money was readily available; it is simply through a lack of, and a failure to appreciate the fundamental need for an effective technology to conserve moisture in the field, an understanding of how that technology works, and how vital it is to the more than 80% of the world's farmers who are 'rainfed'.

Although Africa suffers from cyclic climate conditions, there is nothing wrong or unusual with the soils or the weather in Africa, white commercial farmers in Zimbabwe using irrigation out yielded their American counterparts year after year in maize production, before Mugabe came along. In 1980 Zimbabwe produced so much maize (corn) that its silos couldn't hold it and it had to be stacked in the field under tarpaulins. But that was irrigated farming, the problem the world faces, is that over 80% of the Third world's farmers are rainfed, meaning they rely entirely on the weather to produce their crops.

The aid agencies so far have not come up with any technology that can be used widely to effectively conserve moisture in the field or reduce the 70% of rainfall that presently runoffs the land to the drainage network. Despite all the best efforts at development in the rainfed areas, yields are going down, soil erosion is out of control, increased runoff is causing major floods, loss of life and damage to the infrastructure and all this could get worse with the threat of climate change. The total lack of potable water throughout the developing world has created a serious health problem. Increased runoff does not refill major natural aquifers, which in turn is causing a lack of clean ground water recharging village wells and perennial streams from drying up. The present technologies being offered by the aid agencies to rainfed farmers such as 'No Till', 'Alley Cropping', 'SALT', 'Crop Fallowing', 'Drought tolerant crops', 'Fanya Juu', 'Ridge and Furrow Cropping', etc., are often inappropriate, labor intensive, costly, and not sustainable.

The Vetiver Network International (TVNI), a purely philanthropic organization, has over the past 20 years (with very limited funding and virtually no support from international institutions), developed a technology to economically contain runoff, conserve moisture, control erosion and increase sustainable yields of food/fuel and cash crops in all rainfed areas at very little cost and the potential of a high degree of success (see Debela's statement above). This technology, known as the "Vetiver System" (VS) consists of a dense hedge of the vetiver plant, capable of growing in any soil or 'substrate', under an extremely wide range of pH, and climatic conditions in the tropics. Once established as a hedge it is the farmers' system. Once he has a supply of the plants, he needs nothing else, he can propagate his own plants and plant further hedges wherever he needs them. To do this, he needs no help from the government, no support from engineers, he needs no heavy equipment, all he needs are his bare hands. Once the hedges are established, he has his own system

of soil and moisture conservation which he can hand down to his children, a system that will last for decades with virtually no maintenance costs. A system that will sustain his crop production under extreme conditions. This is the power of the Vetiver System.” Agricultural output has not kept up with population growth in the rainfed areas of semitropical and tropical countries. What we know today about the Vetiver System and its potential benefit for agriculture is much greater than 20 years ago. Vetiver hedgerows will: reduce sediment/soil loss by 90%; reduce rainfall runoff by as much as 70%; significantly help in the maintenance of soil fertility; provide a source of byproducts that can be used as mulch, forage, thatch; clean up on farm pollution; recharge groundwater; biofuel, and in some cases protect crops from insect damage. This is the package that we need to promote and market to the agricultural community. In order to accelerate the use of Vetiver Systems for agriculture and food production we have to see what have been the past bottlenecks to expansion. Recently I invited vetiver users around the world for their feedback. Here are the responses that I received in order of importance:

1. *Lack of knowledge and technology dissemination:* This covers a wide range including ignorance of the technology by administrators, policy makers and planners, uninformed technical professionals and lack of profession endorsement, teaching and learning limitations in universities and schools, limited press coverage, absence of mass marketing, lack of publications (language barriers), and not using modern marketing tools.

2. *Leadership:* New technology introduction requires farsighted leadership with vision and commitment. A committed lead organization is required. Good NGOs and private sector companies can often do the best. Commitment is rarely found in government organizations.

3. *Corruption:* Not always, but generally VS is seen as a low cost technology that does not attract high budget allocations, and therefore the opportunities and attractiveness for corrupt practices are much less than for high cost alternatives.

4. *Technology:* Majority of solutions have in the past an engineering base. Most engineers have not been trained in bio-engineering solutions, particularly those that are low cost. Low cost biological solutions are often seen as too simple and as such are unattractive. Again applying low cost solutions result in lower fees for designers and executing contractors. Many higher cost engineering solutions do not always last long and have to be replaced. – that is good for business! Or as quoted in China, “if the slope stabilization does not fail then what shall we eat”!

5. *Specifications:* Engineers in particular like clear specification. Specifications and standards should be followed – bad application generally results in failure and detracts potential users. Site specificity is important. Often rather general standards are given and followed, and if not properly supervised and fine-tuned can lead to failure:

6. *Multipurpose Use:* Two sides to this one. For some potential user groups such as railway and highway engineers it is best to have narrowly focused workshops and training on the application at hand. For other users such as farmers and rural planners there is a need to look at the wider aspects and the multi benefits that are possible from VS. In other words sometime the focus and the message is not right.

7. *Plant Propagation:* Because Vetiver has to be vegetatively propagated an upfront investment and lead-time is required. This can be a detraction. However there are plenty of demonstrations showing that small farmer private nurseries can be quickly established if there is a guaranteed market.

8. *Invasive Species and Native Plant Syndrome:* This is more of a problem in developed countries. Sometimes deliberate miscasting of Vetiver as an invasive species (this has quieted in recent years). Many government projects in the US will only use native plants. Also entrenched vested interests in other more “profitable” technology work hard to keep VS out and the “invasive” slur is a handy tool to frighten unaware decision makers.

9. *Research:* Some research has been very adequate, in some cases government research staff have shown little interest – conflicting agendas, jealousy, scientists without vision, research lagging behind field developments.

10. *Silver Bullet*: Overselling technology, this can be a problem. But generally occurs when the recipient is looking for problems. VS will do many things, but is sometimes deliberately misapplied in the hope of failure – then the silver bullet has failed. However there are cases where Vetiver has been used in very marginal climatic areas (arid) with poor results. (Note: the terminology – magic grass – was not invented by TVNI).

11. *High Profile Demonstrations and Projects*: In some countries the lack of large scale examples can result in lowering of potential user interest.

12. *Economic Benefits*: Economic benefits are not always obvious to the user, particularly small farmers with limited education. Larger users need to understand the benefits and value of VS.

All of the above are “fixable”. As 2008 has ended we have to give thanks to all those who have contributed to the successes of this past year, I would like to mention all by name. But let me say that everyone’s contribution, however large or small, is truly appreciated. Our global network can only succeed through your initiatives, effort, support, sharing and feedback. It is terrific to see how more and more the VS flag bearers are you, the users, and it is you who create the conditions for progress.

Special thanks to Paul Truong who year after year supports so many initiatives and puts so much time into ensuring that others succeed. Thanks also to those who provide us funds, without this funding support our progress would be far less. I am certain that with world attention on climate change, sustainable food production, and environmental sustainability of the world’s natural resources that the Vetiver System will be increasingly seen as an indispensable technology.

TVNI’s Vetiver Awards

The Vetiver Network International (TVNI) has recently announced its annual vetiver awards as follows:

1. The Best Picassa Vetiver Systems Gallery - \$500

Name: Yoann Coppin - Madagascar

Website: <http://picasaweb.google.fr/Yoannmada/VetiverSystemMadagascar#>

Description: Yoann Coppin for an excellent depiction of sand dune stabilization in Madagascar and the involvement of small farmers in plant material

2. The best Vetiver System Blog - \$250

Name: Alberto Rodriguez - Puerto Rico

Website: <http://vetiversolutions.blogspot.com/>

Description: Alberto Rodriguez has not only created an excellent blog site “Vetiver Solutions”, but has provided us all an example of how powerful a VS blogsite can be. He has also shown initiative in helping others to develop blogsites. He has also established the Caribbean Vetiver Network Google Group

3. The Best Vetiver System Blog with new ideas - \$250

Name: Marco Forti - Italy

Website: <http://www.journalontheland.blogspot.com/>

Description: Marco has shown great initiative in creating his blogsite “Journal of the Land”. It is both in English and Italian and is full of innovative Vetiver applications.

4. The Best Vetiver System Blog that combines a blog with Picassa picture albums - \$250.

Name: Tony Cisse - Senegal

Website: <http://vetiversenegal.blogspot.com/>

Congratulations to you all, and congratulations to all who have taken the initiative to share VS information via the web. Winners will receive a certificate and a check from TVNI.

back since TVNI was established) these workshops (and conferences) have had important impacts on accelerated and widening VS use. We are currently planning two new workshops for March 2009, the first in Nairobi, Kenya (the country of my youth), followed immediately by a large one in Addis Ababa, Ethiopia, that includes a field trip to western Ethiopia, where amongst others we will meet a farmer who has 250 km of vetiver hedgerows on his farm. In both cases we hope that the workshops will expand the use of vetiver into other sectors besides agriculture. During this past year there have been some notable vetiver developments:

Tuon Van of Cambodia has undertaken a large [project](http://www.vetiver.org/CAM_Mekong_Stab/CAM_Mekong%20Stabilization.htm) to stabilize the Mekong River bank on the boundary of his farm. It is not a straight forward job and we are still learning. It is however a great example how almost instantaneously our networking brought together support from Vietnam, Thailand, Australia, and the US. The results thus far have been interesting enough for Shanatanoo Bhattacharya of Assam, India to start a similar river bank stabilization on the massive Brahmaputra River. This one we will follow carefully.

In Madagascar Roley Noffke of South Africa's Hydromulch, working with Yoann Coppin, has stabilized some impressively large [coastal sand dunes](http://www.vetiver.org/Graphics/Images/MAD-sandunetxt.pdf) to meet the road access needs of a major mining company. An interesting facet of this project was the use of local farmers to propagate the millions of Vetiver plants required for this project For these farmers Vetiver plant production became a major cash enterprise, earning them more than US\$150,000. This sort of private sector/community approach should be replicated all over the developing world.

In Vanuatu, Don Miller, has [demonstrated](http://www.vetiver.org/VAN_REEF/VAN-reef2.htm) very convincingly how the Vetiver System can be used as an essential component for the rehabilitation of point source erosion sites (in this case major gullies), and the resultant prevention of sediment flow to the nearby coral reefs.

In California, Doug Richardson, who has now some 60 vetiver projects in southern California, continues to [show](http://picasaweb.google.com/VetiverNetwork/CaliforniaApplications#5217055376996261970) how vetiver can be used so effectively to stabilize slopes and prevent landslides on some pretty valuable residential properties.

In Indonesia, Norman Vant Hoff has worked in Aceh (the Tsunami town that got wiped out) establishing individual and community [waste-water treatment](http://www.vetiver-indonesia.com/sanitation.htm) installations.

These are just a few examples of this year's activities. But all over the tropics VS is now being increasingly used to solve environmental and social problems relating to natural resources and their protection.

In December, A [lberto Rodriguez](http://vetiversolutions.blogspot.com/) who is a vetiver supplier in Puerto Rico (and sells amongst other things good quality vetiver on Ebay) represented TVNI at the "Jamaica - Caribbean All-Hazards Conference", and gave a well received presentation on "VS for Disaster Mitigation". As a result there is a new interest in the Caribbean in VS and Alberto has subsequently set up [Vetiver Caribbean Network](http://groups.google.com/group/vetiver_caribbean) (a Google Group forum) and will take the lead in VS promotion in the Caribbean. In the mean time Tim Journey and Henry Green are working with aid agencies (particularly the World Bank) to introduce VS on a wide scale for the rehabilitation of Haiti. Interestingly we received today this comment from an NGO working in Haiti, Mike Mahowald, who writes "I really know that any agricultural project on the mountains of Haiti that doesn't start with vetiver is worthless".

The March 2009 workshop in Ethiopia will provide a great opportunity to see the progress in that country of the expanding VS program for soil and water conservation that started 20 years ago. Debela Dinka - Sustainable Land Use Forum, Ethiopia, writes "According to our partner NGO in Illubabor, Ethio-Wetlands and Natural Resource Association (EWNRA), vetiver technology is more or less being used in 17 districts of 22 in Illubabor. It is estimated that about 17,000

households are using vetiver. It is expected that the remaining 5 districts will be involved. The major impacts of vetiver are decreased rate of soil erosion; increased crop (maize sorghum, vegetables) yield due to soil and water conservation; reduced siltation of wetlands and streams; groundwater recharge which subsequently improved flow of springs, streams and wetlands; survival rate of tree and coffee seedlings reached more than 80%. Other uses of vetiver: mulching in coffee plantations; thatching of houses, stores and shades (vetiver grass gives long time service); mattress making (it repels home fleas and other insects); homestead hedgerows for beautification; making rope; income generation (farmers sell vetiver clumps for planting materials); and the green leaves of vetiver are cut and spread in and around homes during holidays and social gatherings such as wedding ceremonies." The Ethiopian experience brings us back in a full circle – the need for a renewed focus on expanding the use of vetiver for soil and water conservation – essential if developing countries are going to meet their food requirements.

John Greenfield (TVNI Director) writes, "There is little need to trot out the statistics, it is common knowledge that from the point of view of sustainable food production, the developing world has not made it, and is not making it, especially when we look at Africa. Despite all the efforts of the UN's agencies, and numerous other aid agencies, NGOs and private donors over the past 40 years, Africa still cannot feed itself, what is more, the situation is getting worse. This is not through any lack of money, or international conferences on the subject, when aid money was readily available; it is simply through a lack of, and a failure to appreciate the fundamental need for an effective technology to conserve moisture in the field, an understanding of how that technology works, and how vital it is to the more than 80% of the world's farmers who are 'rainfed'.

Although Africa suffers from cyclic climate conditions, there is nothing wrong or unusual with the soils or the weather in Africa, white commercial farmers in Zimbabwe using irrigation out yielded their American counterparts year after year in maize production, before Mugabe came along. In 1980 Zimbabwe produced so much maize (corn) that its silos couldn't hold it and it had to be stacked in the field under tarpaulins. But that was irrigated farming, the problem the world faces, is that over 80% of the Third world's farmers are rainfed, meaning they rely entirely on the weather to produce their crops.

The aid agencies so far have not come up with any technology that can be used widely to effectively conserve moisture in the field or reduce the 70% of rainfall that presently runoff the land to the drainage network. Despite all the best efforts at development in the rainfed areas, yields are going down, soil erosion is out of control, increased runoff is causing major floods, loss of life and damage to the infrastructure and all this could get worse with the threat of climate change. The total lack of potable water throughout the developing world has created a serious health problem. Increased runoff does not refill major natural aquifers, which in turn is causing a lack of clean ground water recharging village wells and perennial streams from drying up. The present technologies being offered by the aid agencies to rainfed farmers such as 'No Till', 'Alley Cropping', 'SALT', 'Crop Fallowing', 'Drought tolerant crops', 'Fanya Juu', 'Ridge and Furrow Cropping', etc., are often inappropriate, labor intensive, costly, and not sustainable.

The Vetiver Network International (TVNI), a purely philanthropic organization, has over the past 20 years (with very limited funding and virtually no support from international institutions), developed a technology to economically contain runoff, conserve moisture, control erosion and increase sustainable yields of food/fuel and cash crops in all rainfed areas at very little cost and the potential of a high degree of success (see Debela's statement above). This technology, known as the "Vetiver System" (VS) consists of a dense hedge of the vetiver plant, capable of growing in any soil or 'substrate', under an extremely wide range of pH, and climatic conditions in the tropics. Once established as a hedge it is the farmers' system. Once he has a supply of the plants, he needs nothing else, he can propagate his own plants and plant further hedges wherever he needs them. To do this, he needs no help from the government, no support from engineers, he needs no heavy equipment, all he needs are his bare hands. Once the hedges are established, he has his own system

of soil and moisture conservation which he can hand down to his children, a system that will last for decades with virtually no maintenance costs. A system that will sustain his crop production under extreme conditions. This is the power of the Vetiver System.” Agricultural output has not kept up with population growth in the rainfed areas of semitropical and tropical countries. What we know today about the Vetiver System and its potential benefit for agriculture is much greater than 20 years ago. Vetiver hedgerows will: reduce sediment/soil loss by 90%; reduce rainfall runoff by as much as 70%; significantly help in the maintenance of soil fertility; provide a source of byproducts that can be used as mulch, forage, thatch; clean up on farm pollution; recharge groundwater; biofuel, and in some cases protect crops from insect damage. This is the package that we need to promote and market to the agricultural community. In order to accelerate the use of Vetiver Systems for agriculture and food production we have to see what have been the past bottlenecks to expansion. Recently I invited vetiver users around the world for their feedback. Here are the responses that I received in order of importance:

1. *Lack of knowledge and technology dissemination:* This covers a wide range including ignorance of the technology by administrators, policy makers and planners, uninformed technical professionals and lack of profession endorsement, teaching and learning limitations in universities and schools, limited press coverage, absence of mass marketing, lack of publications (language barriers), and not using modern marketing tools.

2. *Leadership:* New technology introduction requires farsighted leadership with vision and commitment. A committed lead organization is required. Good NGOs and private sector companies can often do the best. Commitment is rarely found in government organizations.

3. *Corruption:* Not always, but generally VS is seen as a low cost technology that does not attract high budget allocations, and therefore the opportunities and attractiveness for corrupt practices are much less than for high cost alternatives.

4. *Technology:* Majority of solutions have in the past an engineering base. Most engineers have not been trained in bio-engineering solutions, particularly those that are low cost. Low cost biological solutions are often seen as too simple and as such are unattractive. Again applying low cost solutions result in lower fees for designers and executing contractors. Many higher cost engineering solutions do not always last long and have to be replaced. – that is good for business! Or as quoted in China, “if the slope stabilization does not fail then what shall we eat”!

5. *Specifications:* Engineers in particular like clear specification. Specifications and standards should be followed – bad application generally results in failure and detracts potential users. Site specificity is important. Often rather general standards are given and followed, and if not properly supervised and fine-tuned can lead to failure:

6. *Multipurpose Use:* Two sides to this one. For some potential user groups such as railway and highway engineers it is best to have narrowly focused workshops and training on the application at hand. For other users such as farmers and rural planners there is a need to look at the wider aspects and the multi benefits that are possible from VS. In other words sometime the focus and the message is not right.

7. *Plant Propagation:* Because Vetiver has to be vegetatively propagated an upfront investment and lead-time is required. This can be a detraction. However there are plenty of demonstrations showing that small farmer private nurseries can be quickly established if there is a guaranteed market.

8. *Invasive Species and Native Plant Syndrome:* This is more of a problem in developed countries. Sometimes deliberate miscasting of Vetiver as an invasive species (this has quieted in recent years). Many government projects in the US will only use native plants. Also entrenched vested interests in other more “profitable” technology work hard to keep VS out and the “invasive” slur is a handy tool to frighten unaware decision makers.

9. *Research:* Some research has been very adequate, in some cases government research staff have shown little interest – conflicting agendas, jealousy, scientists without vision, research lagging behind field developments.

10. *Silver Bullet*: Overselling technology, this can be a problem. But generally occurs when the recipient is looking for problems. VS will do many things, but is sometimes deliberately misapplied in the hope of failure – then the silver bullet has failed. However there are cases where Vetiver has been used in very marginal climatic areas (arid) with poor results. (Note: the terminology – magic grass – was not invented by TVNI).

11. *High Profile Demonstrations and Projects*: In some countries the lack of large scale examples can result in lowering of potential user interest.

12. *Economic Benefits*: Economic benefits are not always obvious to the user, particularly small farmers with limited education. Larger users need to understand the benefits and value of VS.

All of the above are “fixable”. As 2008 has ended we have to give thanks to all those who have contributed to the successes of this past year, I would like to mention all by name. But let me say that everyone’s contribution, however large or small, is truly appreciated. Our global network can only succeed through your initiatives, effort, support, sharing and feedback. It is terrific to see how more and more the VS flag bearers are you, the users, and it is you who create the conditions for progress.

Special thanks to Paul Truong who year after year supports so many initiatives and puts so much time into ensuring that others succeed. Thanks also to those who provide us funds, without this funding support our progress would be far less. I am certain that with world attention on climate change, sustainable food production, and environmental sustainability of the world’s natural resources that the Vetiver System will be increasingly seen as an indispensable technology.

TVNI’s Vetiver Awards

The Vetiver Network International (TVNI) has recently announced its annual vetiver awards as follows:

1. The Best Picassa Vetiver Systems Gallery - \$500

Name: Yoann Coppin - Madagascar

Website: <http://picasaweb.google.fr/Yoannmada/VetiverSystemMadagascar#>

Description: Yoann Coppin for an excellent depiction of sand dune stabilization in Madagascar and the involvement of small farmers in plant material

2. The best Vetiver System Blog - \$250

Name: Alberto Rodriguez - Puerto Rico

Website: <http://vetiversolutions.blogspot.com/>

Description: Alberto Rodriguez has not only created an excellent blog site “Vetiver Solutions”, but has provided us all an example of how powerful a VS blogsite can be. He has also shown initiative in helping others to develop blogsites. He has also established the Caribbean Vetiver Network Google Group

3. The Best Vetiver System Blog with new ideas - \$250

Name: Marco Forti - Italy

Website: <http://www.journalontheland.blogspot.com/>

Description: Marco has shown great initiative in creating his blogsite “Journal of the Land”. It is both in English and Italian and is full of innovative Vetiver applications.

4. The Best Vetiver System Blog that combines a blog with Picassa picture albums - \$250.

Name: Tony Cisse - Senegal

Website: <http://vetiversenegal.blogspot.com/>

Congratulations to you all, and congratulations to all who have taken the initiative to share VS information via the web. Winners will receive a certificate and a check from TVNI.

In January 2010 TVNI will make awards for the: best website, most innovative blog site, the most valuable and informative Picassa gallery album, the best DVD movie uploaded to Google video (<http://www.google.com/video>) - max length 30 minutes and the best and most active vetiver Google group. More than one movie allowed. Each prize will be worth \$250.

The Contest Results of "Development and Campaign on Vetiver Utilization"

His Majesty, King Bhumibol Adulyadej of Thailand, has graciously conferred royal trophies to the awarded works of "The Contest on Development and Campaign on Vetiver Utilization under the Royal Initiatives" organized by four agencies: Chaipattana Foundation; Office of The Royal Development Projects Board; The Land Development Department and PTT Public Company Limited (PTT). The project is aimed to inspire public to plant and use vetiver in conserving soil and water.

Having been organized for three consecutive years since 2006, the contest was divided into three categories: Plantation; Plantation Promotion and Product Design and/or new innovations from vetiver leaves. Dr. Sumet Tantivechakul, Secretary General of the Chaipattana Foundation chaired the panel of judges consisting of the top executives of four organizing agencies. The experts on vetiver, agriculture, environment and product designs together with the regional committees, and the sub committee on product design on vetiver leaves were members of the judging panel. Of the 379 entries this year, 49 works were awarded and 29 top-prized winners received the royal trophy from His Majesty the King.

Letters to the Editor

A New Vetiver Network in India

Kindly recall our interaction. We have formed a vetiver network by the name Eastern Vetiver Network, India (EVNI), with office at Guwahati to work in the eastern states of India. We have already got very good response from the Government of Assam who has allotted some experimental stretches of river banks. I will be sending you the photographs of the site very soon. In West Bengal also, we are moving ahead. The Delta region is of special interest to us as voluntary organization based in that region are very eager to participate. We are conducting an awareness program to sensitize the community.

I am in constant touch with Mr. Haridas. I want to operate our network in the "Hub and Spoke" manner with the India Vetiver Network (INVN). We have already got some plants of 'Karnataka' cultivar from Mr. Haridas to set up a mother nursery. I am confident that with your cooperation and affiliation we will be able to go miles.

Shantanoo Bhattacharyya
<shantanoo.bhattacharyya@gmail.com>

Congratulations! As the Registrar of the Vetiver Networks, and as far as I know, your network is the only "sub-country" network in the world since all the other vetiver networks are in different categories from yours, namely international, regional, sub-regional, country, and city.. See articles on India Vetiver Networks in this issue of Vetiverim. -Ed.

Vetiver System in Saline and Tidal Regions

I am the Coordinator of Eastern Vetiver Network, India. I plan to do some river bank erosion control work in the Sunderbans - the delta region of the Ganga and Brahmaputra rivers. The areas

are inundated by tidal movement. Will anyone kindly share some of his experience in vetiver system in saline and tidal region? I will be grateful if the following are clarified:

1. It is suggested that in freshwater river which swells during flood only, that is the swelling is seasonal, the first row should start from the low water level. But in cases of locations which are affected by daily tidal inundation, where should be the lowest row of vetiver? In one report, I found that the lowest row should be one meter above the wet sand line. Should I go accordingly?

2. What should be done to keep the newly planted vetiver plants being washed away by tides?

3. Will the plants survive when they get inundated immediately after planting - which is inevitable?

4. How to protect the toe of the river bank?

Shantanoo Bhattacharyya, Coordinator, Eastern Vetiver Network, India
<shantanoo.bhattacharyya@gmail.com>

May I pass on these questions to other vetiverites who are experts in planting vetiver in submerged banks of the river to answer Shantanoo. Perhaps Xia Hanping who used to plant vetiver along the bank a lake where water level is up and down during the year can answer this question for us. - Ed.

Answers to the Above Questions

I have just started a project on the East Trinity Bay area due East of Houston. This water is brackish and the salinity runs around 16-25 parts per million. I strongly suggest putting up some time of erosion control fencing to slow down the tidal action until the plants take root. If I were to do this again, I would have a bull dozer make a sloping effect along the shore line as opposed to a 3-foot bank that is straight down. The grass was planted in the water which is cord grass which is more tolerant of salinity and the erosion control fencing.

We just experienced the wrath of Hurricane Ike that had a 16-20 foot tidal surge. The vetiver and cord grass made it through okay, I have to believe that the erosion control fencing helped tremendously. We lost about 6-8 foot of linear depth of bay bank but some of my friends lost as much as 25 linear depth of bay bank. This is in an area called Oak Island which was 95% wiped out. Out of 350 homes there are very few left and those need major repair. There were refrigerators 16 feet up in trees!

I was told by a nursery that when Hurricane Katrina devastated New Orleans, Louisiana, the only plant that survived in the nursery was vetiver and the entire nursery was under water for several weeks. I also heard a similar story from a Nursery in Lake Charles, LA. from Hurricane Rita so I believe that vetiver should survive short periods where it is under water.

Warren Sullivan
<warren@sunflower.com>

Controlling Sugar Cane Stem Borer

For those of you in countries that have a sugarcane industry you might like to know that Guatemala's largest sugar plantation is now producing (via tissue culture) a million plants of vetiver a month for plantation stabilization purposes. An interesting side observation is that sugar cane stem borer incidence is reduced, because just as with maize borer the moth prefers to lay its eggs on the vetiver leaves rather than on the cane. This follows Johnnie Van den Berg's (South Africa) "push pull" proposals for the use of VS. see:

<http://www.vetiver.org/ICV3-Proceedings/SA_stem%20borer.pdf>

I hope to receive more info from Guatemala in the future.

Richard Grimshaw, TVNI
<r.grimshaw@comcast.net>

Responses to the Above

This is interesting. The cane toad is an absolute menace, now responsible for all manner of indigenous animal deaths in Australia, from Eagles to the large Goannas - these animals eat the road-kill cane toads which in turn poison them. Dead toads are just as lethal as live ones. The cane toad was introduced to control stem borer in sugarcane, and has turned out to be one of the worst biological control measures ever made.

When I planted vetiver throughout the cane areas of Fiji, none of us gave a thought to controlling the stem borer but in fact this happened. The stem borer which had been a big problem, just seemed to disappear - and, for some obscure reason, so did rat damage. Come to think of it.

John Greenfield, TVNI Board of Directors
<27@xtra.co.nz>

The stem borer moth prefers to lay its eggs on vetiver rather than maize, sugarcane or rice. The moth does no damage. The larvae, when hatched, do not like the hairy leaves and fall off on to the ground where they die or are eaten by other predators.

This is explained in detail in a presentation by Johnnie Van den Berg of South Africa:
<<http://www.vetiver.org/ICV4-ppt/DAS04-PP.pdf>>

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