VETIVERIM

A Quarterly Newsletter of the Pacific Rim Vetiver Network

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Editorial

Good Things Do Happen in This World!

Before reading further onwards, the Editor would like to invite the readers to read the last page of this issue of Vetiverim on "Letter to the Editor", written by Mark Dafforn of the US Academy of Science.

As mentioned in Mark Dafforn's letter, "30 million saplings (slip should be a better term to use, as sapling is a young tree, not a young grass - Ed.) of vetiver grass will be planted in the next two months as part of Thai flood prevention plans in riparian zones". It is true that a large number of vetiver slips, mostly in plastic bags, were planted to alleviate the hazard of the worst flood in the history of Thailand in a large area in Central Thailand including Bangkok and its vacinity. After the flood, the Prime Minister reported to His Majesty the King on ways and means to solve the problem of future floods. His Majesty suggested that in addition to other conventional approaches, vetiver should be considered in planting along the areas having high risk of erosion.

It has been a common practice in Thailand to plant around 300 million slips of vetiver annually, starting some 20 years ago. Thus, a total of 6,000 million clumps of vetiver should be established where they were planted. Assuming some died of shading effect of large trees, some died of lack of water, or of fire and flood, at least half should survive. But where are those 3,000 million clumps of vetiver?

In a vetiver literature, it was stated that once vetiver is planted and being taken care of during the first 2 years, it will survive to the next 200 years by itself. What happened to the vetiver clumps planted during the past 20 years, only one-tenth of the duration it would expect to survive. It is sad to say that most of them have disappeared from where they were planted. Thus, we should not pay attention to the number of vetiver slips being planted (although it make sense for the budget acquisition), but the number of clumps survived after 2 years. There must be something wrong in the system of planting and maintenance. Analogy of this situation is the number of saplings planted for reafforestation in Thailand in which a few survive, even only less than 2 years from the day they were planted. Is there a better way to grant budget for tree and vetiver plantings. Forget about the number being planted but consider the number of survival after a period of time.

A Dialogue on Cattle Grazing on Vetiver

It all started when Tim Journey throw an idea in the vetiver web board <vetiver-system@googlegroups.com>, "What effect do you expect that cattle hooves will have on the vetiver root crown, and how might damage to the root crown affect the pasture rotation cycles of burn / re-growth / graze / recovery, etc.?

Dick Grimshaw's <r.grimshaw@comcast.net> response on 17 Jun 2012 was, "One of the advantages of vetiver is that the crown is under ground and protected from trampling and fire. In Fort Polk, Louisiana, USA they ran tanks all over it without any lasting damage."

John Greenfield (27@xtra.co.nz> joined the band wagon as follow, "I have recommended to my Grazier friends in Australia that for supplementary grazing in drought conditions they plant vetiver hedges across the drainage networks on their properties. In a normal season, the stock would graze the pastures (preferred as vetiver grass is too tough) while the vetiver grass would harvest the runoff nutrients and store moisture. In a drought it would be the only 'green pick' left."

Dick Grimshaw referred to Warren Sullivan <warren@sunflower.com>, who has a farm on Trinity Bay, Texas, USA, is interested in using vetiver as a forage to feed his cattle. Here is an update from him: "Just an update on how the test plot of vetiver was received by the cattle and how it tested out for food nutrients by Kansas State University. I planted approx. 150 vetiver plants that had been cut back to about 4 inches above the crown on a small test plot of ground. This area was shut off from all grazing for one month. The grass was well watered with sprinklers to enhance growth. The length of the grass was easily10-12 inches in length. Cattle were then turned in and they grazed the vetiver to the ground. When I returned to Kansas, I cut the tops off several vetiver plants that I had brought back with me and took it to Douglas County Extension Agent who sent the vetiver sample off to Kansas State University for food nutrient testing. The results were that vetiver had a 14.7% crude protein on 100% dry matter and the total digestible nutrients (TDN) came in a little less than 100. These results beat out brome hay which had a crude protein content of around 10% and the TDN for brome came in less than vetiver".

This feedback from Warren Sullivan <warren@sunflower. com> confirms that when managed and fed at a young age vetiver provides quality forage. According to him, "It would be good if some extensive research trials could be carried out by a university to identify the optimum management practices that would provide maximum output of quality vetiver forage - fed as green forage, hay and silage." He went on to say that, "If the best practice could be identified vetiver might then be introduced as an important forage plant that is drought tolerant and resistant to most pests and disease. I would like to think the vetiver crown will not be hurt from cattle occasionally stepping directly on to the center of the plant. I would not want the vetiver to be directly in the middle of a cattle trail where it would consistently be run over by heavy weight though. I believe if I can figure out how to plant and harvest vetiver economically on a large scale, it certainly would be a good source of hay for this climate. Last year some cattlemen were paying $225.00 per large round bale (approx. 1,400 lbs.), for anything that could be baled!" At the end, he said that, "I am a big believer in burning the vetiver at least once a year and the result is like adding liquid fertilizer from what I have personally experienced. I also think you may need to graze vetiver more than a regular prairie grass or vetiver will become too coarse and cattle will not eat it. Due to how fast vetiver grows in warm humid climates, you may be able to get an extra hay cutting as well?"

Tim Journey <timjourney@gmail.com> provided valuable information concerning nutritional value of vetiver grass as he said, "Thought I would share the latest test results on the vetiver grass cutting that I just received back last week.

Feed Analysis Results	**As Received 100%**	**Dry Matter**
Moisture, %	78.4	
Dry Matter, %	21.6	
Crude Protein, %	1.9	8.8
Acid Detergent Fiber, % ADF	9.4	43.5

Total Digestible Nutrients, % TDN	11.8	54.3
Net Energy, Maint, Mcal/lb	0.11	0.51
Net Energy, Gain, Mcal/lb	0.05	0.25
Net Energy, Lact, Mcal/lb	0.12	0.55
Digestible Energy, Mcal/lb	0.24	1.09
Met. Energy, Beef, Mcal/lb	0.19	0.89
Calcium, % Ca	0.10	0.44
Phosphorus, % P	0.05	0.24

The above feed analysis report sampled August 1, 2012 reflects 8.8% crude protein (second cutting) *vs* the 14.7% crude protein (1st cutting), results which was sampled and tested at the end of May 2012. It makes sense if you harvest grass at an earlier stage (3 months *vs* 8 months) it will yield a better protein content. The problem is that you will not get as much volume as you would have if you waited to harvest at 8 months. Thus lies the question do you want higher protein content or more volume?

Warren Sullivan's <warren@sunflower.com> response was as follow: "I would like to think the vetiver crown will not be hurt from cattle occasionally stepping directly on to the center of the plant. I would not want the vetiver to be directly in the middle of a cattle trail where it would consistently be run over by heavy weight though. I believe if I can figure out how to plant and harvest vetiver economically on a large scale, it certainly would be a good source of hay for this climate. Last year some cattlemen were paying $225.00 per large round bale (approx. 1,400 lbs.), for anything that could be baled!"

At the end, Warren added the following message, "I am a big believer in burning the vetiver at least once a year and the result is like adding liquid fertilizer from what I have personally experienced. I also think you may need to graze vetiver more than a regular prairie grass or vetiver will become too coarse and cattle will not eat it. Due to how fast vetiver grows in warm humid climates, you may be able to get an extra hay cutting as well.

In response to Warren Sullivan's statement (above), Tim Journey <timjourney@gmail.com> had this to say, "What effect do you expect that cattle hooves will have on the vetiver root crown, and how might damage to the root crown affect the pasture rotation cycles of burn/re-growth/graze/recovery, etc.?"

To which Don Miller had this to say, "There could be some experience in Thailand of water buffalo treading on vetiver. I think the impact would depend on the wetness of the soil and the degree of pugging involved.

Dick Grimshaw's s response was, "Probably very good advice. Still it is time some serious experiments are undertaken how to manage vetiver as a forage - we know it can be "good", how do we sustain it and at what level.

Don Miller wrote: I would be inclined to treat vetiver as one treats alfalfa (lucerne) crops. Don't graze or cut it too frequently. Maybe alternate "cut" and "regrow to full height" cycles to avoid depleting root reserves too much.

Finally, Vinod Kumar stated that, "Interesting optimization problem. If we can plot the volume and the protein content against months and multiply the two at each time point we will get an idea of how the total protein varies over time. I feel that this will increase monotonically up to some point where the volume tapers off. So my hunch is that the best period to harvest the vetiver for forage would be a month or so before the growth tapers off.

The Project on Planting Vetiver for River Bank Stabilization at Vinh Long, Vietnam*

1. A Scope of the Project:

1.1 Erosion Condition at Mekong Delta: Recently, the erosion of river bank has caused a huge damage for the local people and government in Mekong Delta. It is estimated that there is an

annual loss of 22-25 ha, 142 billion dong and 300 households by riverbank erosion. In Vinh Long, there were 63 affected areas with 115km of eroded river bank and theloss rate is up to 1-3m/year at Giong islet, My An islet, Xa Tau- Soc Tro canal, Long Ho lake. In this situation, the government supported Vinh Longto implement the trial of planting Vetiver for river bank stabilization in 2005. After 7 years, this report aims to evaluate the successes and failures of the project.

1.2 General Introduction:

The projects included the vetiver planting at four places:

(1) Seafood farm at Giong islet (Vinh Long),
(2) My An dyke(MangThit),
(3) Xa Tau- Soc Tro canal (Tam Binh), and
(4) Muong Lo canal (Long Ho).

The amount of vetiver required was 556,445 clump and funded by the Ministry of Agriculture and Rural Development. Totally, the grass was planted on more than 36 km of river bank.

1.3 Contractors:

Client: Vinh Long Department of Agriculture and Rural Development
Construction: Water Resources Department in Vinh Long
Designed consultant: Vinh Long Construction SJC
Supplier Con Bach Vien Department of Agriculture (Chau Thanh,Dong Thap)

1.4 Design:

Vetiver grass was planted on the topsoil of the dykes, river banks.
Planted 4 rows on the banks at 30 cm spacing
Planted perpendicularly to the rows at 30cm spacing
Used excavators and workers to reslope and prepare the site.
The grass need to be watered within 1 month.

1.5 Implementation:

The local Government is responsible to clear the trees near the channel and reslope the banks.
The contractor was only responsible for planting grass.

2. The Implementation of Projects:

2.1 The Process of Project Implementation:

Started planting: on 20/10/2005 and ended on 31/12/2005.
The implementation at Con Giong was cancel due to the unfinished work at Con Giong dike.

2.2 The Results:

Work: Finish 75% (The grass was not planted on Con Giong embankment)
Length: 20.905 km (reaching 58.42% of the plan)
The number of grass clump: 334 440 clump (reaching 58.42% of the plan)

3. Project Evaluation:

3.1 Advantages: This was the first time the local government could get a large budget from the central government. This has contributed to improve people awareness about the effects of climate changes. Furthermore, soft solution has been tried for the first time instead of conventional solutions using concrete in this area.

There was strong support from the local communities in the area where the grass was planted. However, this is the first time using vetiver in this area, so some selected places was not appropriate. After the planting of grass was finished, the local government was responsible for taking care of them directly. 70% of grass grew well after planting, especially the area near fish pond.

** By Ha Thanh Thang, Vinh Long Department of Agriculture and Rural Development, Vinh Long, Vietnam.*

3.2 Disadvantages: The selection of planted area at Xa Tau channel – Soc Tro and Muong Lo canal did not measure all the difficulties due to the serious erosion and residents living densely along the banks. This led to construction difficulties, and lowered the effectiveness of the design.

The grass was dug up and planted directly to the site and required a lot of time for watering and caring. Therefore, the proportion of survival grass was low (50%). At some places the grass even planted directly on alkaline or clay soil without fertilizer. The best method is planted the grass in plastic bag until new roots grow. Then the grass can be used to plant on site.

4. Project Evaluation

4.1 Ineffectiveness of Protecting River Bank from Wave: After implementing the project, it can be concluded that:

Vetiver, which was planted on top of the embankments, grew well and stopped the river banks from erosion. However, the grass closed to the water line was ineffective against the waves, which were generated continuously by thousands of boats travelling along the river every day.

In canal: The area that was planted with vetiver had less erosion than the others. However, the root only grew up to the length of 0.8m where they reached the clay layer. However, the roots grew very thick in the top soil. The waves generated from travelling boats caused erosion at the transition layers between top soil and clay layers and lead to the landslide of the top soil.This situation occurred after the vetiver planted on the west bank of the channel at Phung Hiep Highway in 2005-2007.

After planting process was completed, lacks of care from the local people and government caused the increasing of death rate of vetiver grass. At that time, there were four planting projects launched in 2005, and the grass hardly survived in Xa Tau channel - Soc Tro (Ngai Tu), My An islet (particularly near the catfish ponds, vetiver plants were total removed because the local people thought that vetiver grass was the reason for the increasing number of mouse in the area).

Some other reasons that made people 'did not like' vetiver grasses is that it was too high, especially in front of the houses along the river. Also, the farmers in the province could not use vetiver to feed cattle (due to the sharp edges of the leaves).

In 2006, Craft Cooperative Vinh Long (now Vinh Long Business Corporation at Hoa Phu Industrial Park) used the grass from An Giang as material for handicraft making, but unfortunately, it was not successful because its sharp leaves could cut the worker's finger thus slowing down the process.

4.2 To Use the Vetiver System More Effective: To prevent the situation of bank erosion caused by waves, it is suggested:

- To use sand bags, rocks at water level, combined with planting other plants such as water hyacinth, vegetables, spinach, cypress, and coconut. However, these measures increase the cost and depend on the conditions of particular area.
- To encourage and train the local people to use vetiver properly (such as stems, leaves) for other applications to earn extra income, such as handicraft making and feeding cattle. This can be done by inviting experts from Thailand or China to share their experience.
- To use vetiver grass for wastewater treatment at the catfish factory in this area.

Intensive Workshop on Vetiver in the Philippines

You are invited to the most-awaited learning event on vetiver! If you are a:

- farmer especially those who want to shift to organic,
- agriculturist, architect, real estate developer, waste water contractors,
- mining industry,
- environmental officers, municipal and provincial agriculturist and engineers of erosion-prone areas,

- property owners with slopes in critical areas,
- big idle land owners,
- students and academe of civil eng'g/ biochem/architecture,
- hobbyists (cosmetics, fragrances, herbal med).

The main speaker, Noah Manarang, is a certified Class 1 consultant for vetiver grass technology in four fields: propagation, slope stabilization, erosion control and rehabilitation of contaminated lands. She is the first Filipino and one of only 23 certified Class 1 Vetiver Specialists Worldwide.

The Date & Place

Wednesday, December 5, 2012, Flors Garden Antipolo, Rizal, the Philippines, :00 am - 5:00 pm

Topics:

1. Design and Implementation of Different Vetiver System Applications:
   A. Vetiver as a Cost Efficient Solution For:
      - Waste Water Treatment: hydroponics and grass beds
      - Erosion Control and Slope Stabilization
      - Agriculture: Integrated Pest Management and Soil Rehabilitation
   B. Vetiver Integration with Other Technologies
      - Cocofiber technology
      - Gabion engineering system
2. Propagation and Maintenance of Vetiver
      - In the nursery
      - On site
      - Out-planting & maintenance in various project sites
3. Project Costing
      - Time and Motion: How to compute accurately for the price and timetable for your projects
4. Other Business Opportunities in Vetiver

Learning Investment:

Php 4,500/ person
Early bird rate until Nov. 16th - Php 3,500/person
*All fees include AM/PM snacks and lunch
*Rates apply on the exact date you fully pay for your slot
Slots are limited so we encourage you to register early!
For ticket reservations, email your name and contact details to:
<collaborate@juggernaut.ph> and put "VETIVER" in the subject line.
You may also call our project secretariat office at +632 547 3734 (Mon-Fri, 10am-4pm)

Abstract of Vetiver Article

Title: Comparative study of natural and chemical clay stabilized materials in terms of durability by using uts spray test technique.

Authors: Rattapoohm Parichatprecha[1], Thapanee Supakitwattana[1], Thanapon Phenrat[2], Nikom Thepabutra[3], Suppanon Bunjongkleang[4] and Pitiwat Wattanachai[4]

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Keywords: clay composite material, natural latex, molasses, durability, and UTS spray test.

Abstract: Clay is one of the most common traditional building materials used in various forms with natural fiber such as straw clay bricks, vetiver clay bundle for construction of paddy storage, vetiver clay guide-post, and plaster. Historical clay or adobe architecture is a heritage that must be handed over to the next generations but experience shows that these historical structures do not stand up well

against the destructive action of rain. This study aims to investigate the influence of natural and chemical clay stabilized materials in durability performance by using UTS spray test technique. The mechanical and durability properties of stabilized materials namely natural latex, molasses, calcium chloride, and sodium chloride were examined. Based on the results obtained, it was found that adding 5-10% by weight of binder of natural latex can significantly improved the mechanical and durability properties. In the other hand, very low effect in mechanical and durability properties was found when molasses, sodium chloride, and calcium chloride were used as stabilizer. It was also found that the higher the natural latex content, the higher the durability. Adding 10% and 20% natural latex into the clay matrix induced the very low leaching of 3.4 and 2.6 centimeters, respectively. Furthermore, it was summarized that the natural latex was the most suitable stabilizer when comparing with the molasses, sodium chloride, and calcium chloride which adding 10% of natural latex to the clay matrix can be enhanced the durability against the leaching from rain fall up to 10 years.

Letters to the Editor

His Majesty's Brilliant Contribution

I have read with great interest the article on "King Bhumibol Adulyadej Receives Humanitarian Soil Scientist Award" in Vetiverim 60. It shows His Majesty's brilliant contribution to the world's soils and their stabilization. I only hope Thailand realize what a fantastic leader they have in the King. In all my work round the world, I have only found one other leader with similar passion for his country's benefit, and that was King Hussein of Jordan.

John Greenfield, TVNI Board of Director, New Zealand
<27@xtra.co.nz>

I don't have anything to add other than "without the King, there is no vetiver in Thailand, and when you see vetiver - think of the King; when thinking of the King - plant vetiver." ***– Ed.***

ICV-5 PowerPoint Presentations

I have now uploaded all the ICV-5 PowerPoint presentations, in pdf format, to Google Docs. You can access them at: <https://docs.google.com/open?id=0B3E8MMCy36wZYTU0ZjczN2ItYzlkYi00ZDYzLWIxNmEtYzAxYjA2Mjk1N2M5>.

I have divided the 48 presentations into a number of topics in order to help access topics that might interest you. I will upload the texts for each presentation in the next week or so. Please let me know if you have difficulty in accessing any specific file.

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

Vetiver to Bioenergy

Vetiver to bioenergy, in itself, does not seem to be a self-sustaining process. Not if you grow vetiver only for energy, unless it is grown on badlands. A wasteland, or bringing a discarded mine area back to life with vetiver, can have energy production as an additional benefit.

Let us examine a few applications of vetiver for environment protection.

1. Vetiver in a catchment area: Since the areas involved can be large, large tracts of land needed to be covered with strategic plantation of vetiver. There can be enough vetiver to use for energy production. Depending on the area involved, the process can be chosen, from biochar to gassification to biomethanation. The energy production is additional to the main project. Another additional benefit is the carbon stock below ground, as the grass has been grown for keeps.

2. Landfill Leachate: This is another wonderful example of vetiver being used for neutralizing landfill leachate and the above ground biomass being used as or for producing a biofuel.

On critical places like slope stabilization, or disaster management, we can't have people, in my opinion, coming in and looking at the fuel option, unless it is scientifically done under expert

supervision. The poorest of the poor who have used up jungles in some countries, should not be exposed to the energy potential. They surely will not, at a later date, be able to distinguish between a critical use of vetiver and vetiver as a cheap source of energy. Bioenergy as an additionality in specific projects will make the whole project more sustainable. In such projects the idea of *shared value* fits in.

M.P. Singh
<mpsingh@earthizenz.org>

Good Things Do Happen in This World!

I saw in *Dredging Today* (a very fine publication!) that 30 million saplings of vetiver grass will be planted in the next two months as part of Thai flood prevention plans in riparian zones; that's a goodly chunk of planting, and I naturally thought how wonderful that vetiver may help protect your own home in the future. Searching to learn more, I also saw that this week His Majesty had to postpone a trip to Ratchaburi to visit vetiver he planted in 1992. This of course stirred many additional emotions, so I just wanted to send a note to say I hope you all are doing well, and to thank you again for the camaraderie you have shown to us -- and to vetiver! Thai work with vetiver has been a boon for people around the globe, and now vetiver is repaying that foresight in Thailand itself. Good things do happen in this world!

Mark Dafform
U.S. National Academy of Science, Washington, DC, USA <VetiverNet@aol.com>