From: Organic
To: jsmyle@earthlink.net
Cc: elim@tns.org
Subject: Re: FW: Vetiver as a water filtration system
Date: Saturday, June 2, 2012 1:07:14 AM

Dear Eunice,

Here in Costa Rica I sold a lot of vetiver starts a few years back to a large cooperative that was trying to get Rainforest certification. It was CoopeLibertad and I don't know if they followed through or not. Starbucks was also motivating coffee farmers to use vetiver. I remember feeling good about coffee farmers wanting to plant vetiver! The vetiver is used in Costa Rica to fight soil erosion and to hold embankments. In my fields there is a lot of shade so vetiver does not thrive as well as in sun coffee plantations.

One of our neighbors with 2000 hogs has vetiver all around the sedimentation lagoons and is very pleased. We provided it for planting the mounds in San Jose's sanitary landfill. Most of our vetiver experience has been in organic waste treatment vs chemical waste treatment.

What waste water from coffee farms are you talking about? Is there is chemical runoff from herbicides and fungicides in coffee fields? In this case a certification process will address the problem firstly through limits on usage. But the runoffs definitely could be mitigated by using vetiver in drainage ditches and along points of entry into bodies of water. You should first identify the specific chemicals that need to be "filtered" or controlled. My guess is that if it is water soluble vetiver can deal with it. And being a coffee farmer for 33 years I've never had a water problem vetiver couldn't handle. It has been generations since lead arsenate was used and Endosulfan is not even allowed in coffee though I know farmers have used it. Another posibility is the use of nematicides. I do not know how vetiver would handle these; they would be serious problems for the water system. Is this the type of chemical you are worried about?

Regarding waste water treatment for coffee milling--we have been doing about 200 fanegas on a small farm for many years and even received an award from the Costa Rican Ministry of Environment and Mines for "voluntarily not polluting". We believe that vetiver can be used as an integral part of a well planned wet milling operation. All by-products of the coffee milling process are valuable, are recycled and used here on the farm. The technology is all low-tech.

Any water used must be treated; therefore, it is imperative to **minimize the amount of water used**. We collect rainwater from the patio roof. (Lots of rain here.) Water should not be used to transport the cherries as used to be custom in the old large mills. There are pulpers that work dry or with just a few liters of water. After pulping, the seeds pass through a mechanical mucilage remover that cleans off the miel or slime. The beans then can go directly onto the patio. (We do NOT use a cano to sort the coffee beans because it uses too much water). We leave the beans overnight in a tank just barely **covered with water** and put them out to dry the next morning. This is to skim off floaters, kill any leftover *broca,* and give it a little rinse. So the water we use is **minimal** and still clean enough to go right into the field or via a simple sedimentation tank. This is where a vetiver field would be beneficial--it can filter the rinse water of solids and slow it down. Since the water is drained out of the tanks all at once it needs to be slowed via the sedimentation tank/pond and dripped out more evenly through a vetiver field.

Problem is the slime or miel. This is the contaminant that needs to be handled very carefully,

and with mechanical removal
the by-product equals the amount of green coffee. We drain it into a small tank and drip it little by little into a bio-digestor. The gas is used for cooking and the effluent is perfectly safe for the soil. Other folks mix the miel back in with the *brosa* but then you get more leachates that have to be drained via pipes into the slime tank and bio-digestor. This leaching can kill the soil so has to be handled carefully. We have planted vetiver all around the area of the slime holding tank and the sedimentation tank as protection. Leakage or sudden earthquake damage could ostensibly be soaked up by the vetiver preventing contamination in the surrounding field.

The coffee pulp is treated with microorganisms for composting and used in our bokashi recipe. The cascarilla (chopped parchment) is made into bio-char. The rinse water can be used for irrigation, but we get too much rain at harvest time! I would love to put fish in the unused sedimentation tank. The health dept made us dig the tank since they had no concept of how an ecological mill functions. It was an added expense for a small operation and now sits empty. The health department was only familiar with large mills using lots of water! We use more water to clean the machinery and floor than we do in the actual processing.

Mechanical **mucilage removal** from the coffee reduces water consumption and eliminates organic matter discharge from the slime. A vetiver field can easily handle the rinse water making it safe for irrigation or eventual return to a stream.
You ask specifically about what chemicals the vetiver would filter. No chemicals are used in coffee processing. Remember the culprit to be dealt with is the miel.

Transport of fruit is via conveyor belt. Transport of pulp is via augers. Liquids (miel and water) move through pipes.

I pretty much described how we do the wet milling. The point is that we use very little water in processing and the water is never mixed with the miel so the water is not dangerous for the environment. Colombia is a leader in safe ecological coffee processing. We have bought machinery from Penagos.

Again, I am not sure what chemicals or what waste water is specifically the problem. I addressed the issue as we know it here. For us the serious issue is the miel.

Not very scientific, but my personal opinion is that wherever there is water on our farm, vetiver is there to help us. I know my response may be too general for you, but our experience has been dealing with vegetative and animal waste (except for the city dump) rather than chemical.

Good luck,
Linda
Finca Cristina
Paraiso, Costa Rica

On 5/30/12 4:04 PM, Jim Smyle wrote:

> Dear Linda,

I hope this note finds you well. I look in on Finca Cristina now and then on the internet and it appears that you have grown and become a model farm for Costa Rica and beyond. I am writing to pass on the note below, wondering if you might have any words of encouragement and possible contacts for Eunice. It appears that you have a different system now for treating your water but you may also be able to offer Eunice some tips on your prior experiences.

All the best,

Jim

From: Eunice Lim (TNS-Colombia) [mailto:elim@tns.org]
Sent: Wednesday, May 30, 2012 4:24 PM
To: jsmyle@earthlink.net
Cc: info@vetiver.org; p.truong@veticon.com.au; Dick Grinshaw H
Subject: Re: Vetiver as a water filtration system

Dear Jim,

Thank you so much for your help. I am working with a group of coffee farmers in the Antioquia area in Colombia. I am working with TechnoServe, and we are trying to find some solutions for low-cost waste water management for coffee farmers there. I understand that Colombia has not yet implemented vetiver as a waste water management system. I have been reading the documents, but I have been having a difficult time understand exactly how much it is able to treat the water. We are specifically trying to understand if it will treat the waste water enough to qualify for Rainforest Certification Standards of waste water treatment. Any help connecting me with people in Colombia or other experts would be much appreciated.

Thanks,

Eunice

On Wed, May 30, 2012 at 4:13 PM, Jim Smyle <jsmyle@earthlink.net> wrote:
Dear Eunice,

Vetiver has been successfully used for this application. You will find some examples HERE and also find information of treatment of other contaminants HERE. Let me know in what country or countries you may be wishing to test vetiver and perhaps we can connect you with people in-country with specific experience and/or with plant materials. HERE is a very recent example that has just come to our attention, in Brazil…if you don't read Portuguese, you can read the site in google translate. You can also download TVNI technical manuals at our website (www.vetiver.org), in particular the 2008 VS For Improving Water Quality

might be useful. I am copying Dr. Paul Troung who is the principal author of those manuals and who has designed quite a few systems…most recently for treatment of landfill leachate in Biloxi, MS; a project that one an engineering award this last year.

Let us know how we may be of further assistance.

Jim Smyle

From: Eunice Lim (TNS-Colombia) [mailto:elim@tns.org]
Sent: Wednesday, May 30, 2012 1:06 PM
To: info@vetiver.org
Subject: Vetiver as a water filtration system

Hello,

I am doing some research trying to figure out if Vetiver would be able to act adequately as a water filtration system for waste water from coffee farms. We are specifically trying to understand if it can purify the water enough to meet Rainforest Alliance Certification standards (http://www.rainforest-alliance.org/certification-verification). Do you have any information around numbers that show specifics around the level of filtration vetiver is able to perform? I've looked at several articles around waste water management, but I was looking for more specific information around water filtration for waste water on farms, and the types of chemicals it is able to filtrate. Also, are there examples of how this has been done?

Thanks,

Eunice