

Some Of John Greenfield's "thoughts" from the past year or so.

"Just a thought" he would say.

Planting Material

"I hear of the high price/slip for vetiver at present in Hawaii. This is bloody ridiculous, in the tropics the slips should be the cheapest part of the whole operation. In Hawaii, with its extremely variable rainfall, you may have the high cost of drip irrigation to get the hedges established as the rainfall can vary from 200mm on the coast to over 2000mm up the slope. All my work in Fiji was done with slips split from clumps – at \$5/ slip you will get every cowboy in Hawaii getting in to the business, especially when vetiver is the easiest plant in the world to propagate in a nursery or the field. And do people know what they are actually buying from the cowboys, do they know what vetiver grass looks like? We should get in to registering growers and contractors somehow for the Vetiver System, or they will plant it any way and give it a bad name. The USDA would love to see it fail, especially on a steep slope. Vetiver's greatest advantage in high cost areas, is the virtual 'no' cost maintenance of established hedges as opposed to the high continual cost for maintenance of constructed works. Once established, you can forget about it under all conditions of extreme weather including seismological problems in the Islands – namely, earthquakes."

"Let's not get too complicated here, all I can say is when I established the vetiver system in the Fiji Islands over 50 years ago that not one of the millions of plants supplying the planting material for 400,000 acres of hedges planted, was given any special treatment. All planting material was from slips broken from vetiver clumps from road-side "nurseries" or farmers field plantings. This was the basis of the vetiver system's popularity, it cost the farmer virtually nothing. Not one poly bag was ever used for propagation; and by planting at the beginning of the wet season, not one plant was ever watered and we never had any problems with establishing vetiver hedges. All this special treatment of planting material in the tropics is a waste of time and money, the vetiver plant is unique in its hardiness, planting should be backed up by a good system of 'gap-filling' along the hedges."

Vetiver Hedge Design

"I was just taking a look at our website especially the bit from the USDA "Vetiver installation guide" – I am glad to see the USDA has had a sudden attack of common sense and almost agreed that the Vetiver System may be better than their constructed banks, especially in the tropics. But the point that I would make is that vetiver hedges do not have to be planted on the contour. This was the mistake I made initially in Fiji. We thought the vetiver system as taking over from the system of Banks which must be strictly laid out on the contour to work. As you know, to lay out a contour bank, it has to be 'surveyed' in; where it crosses rills or small gullies it is contorted making it almost impossible to follow with the plow; if you want the contour bank to 'spill' in any particular area you have to start your 'survey' from that point and work backwards pegging the bank in; in other words it is bloody difficult and totally unnecessary to plant vetiver hedges on the contour especially in developing countries where they don't have levels (and don't need "A" frames) and they don't have the training. I would like to suggest that at ICV6 we remove "contour" from future literature and recommend planting vetiver hedges across the slope in an even unconvoluted hedge – across the obvious rills where insipient erosion is taking place. Emphasise planting hedges across gullies and not around them. In Fiji where an extension worker had not followed the contour, we made him pull the hedge up and replant it – not realising at the time, how the 'flow-through' vegetative system worked. You only use contours for irrigation or aqueducts, not 'dryland farming'. Put it in the webpage".

Hedge Management

"Regarding the 'donut' hole in the vetiver clump – I have had regrowth along the edge of vetiver clumps in hedges here in NZ, but once they are clipped back to size – about 40cms – they close over again leaving no gap in the middle"

"If you have feral goats, you have terminal problems foliage-wise. They will just destroy young vetiver hedges, the only solution is to shoot the buggers. They were no real problem in Fiji as the Indians, not eating Beef, ate goat (curry) keeping the numbers well under control. One point the Indians farmers made to me was that mature Vetiver hedges were the best thing to contain goats - they just couldn't get through them or over them".

"Regarding the poor ratooning of vetiver grass, on the Ho Chi Minh Hwy cuttings. I was mulling over this problem and it is interesting in that when vetiver hedges are grown in association with sugarcane, they persist for years in perfectly good shape – is this because the cane trash is burned after harvest, also burning all the trash out of the line of vetiver grass – is vetiver grass a victim of its own dense trash? In Gundalpet, India where vetiver hedges have been growing in the same area for centuries, is this the result of bi- weekly harvesting of green leaves for fodder and not allowing the trash to develop? In New Zealand I find it essential to burn the vetiver grass at least every other year, and the trash burns like 'hell', it is so volatile that I advise planters to keep their vetiver hedges away from houses and have some means of 'fire-fighting' handy. After the fire, the hedge is back in no time. In Fiji I used to consider vetiver hedges to be 'fire-proof' mainly because Green vetiver hedgerows are very dense and fire has difficulty in penetrating the grass. Under such circumstances the hedgerow actually acts as a fire break to slow creeping fires. In Fiji where vetiver was grown in conjunction with sugar cane it survived the annual fire that was set prior to cane harvesting"

Vetiver Trials

"We're all getting far too scientific here, by the time you have found the ideal catchments, then you need the rainfall data, recording pluviometers and at least three replicates..... In India, I got half the farmers of one village to put in the vetiver hedges and carry on with their traditional farming, the other half just planted in their normal fashion without the hedges. It was an exceptionally bad rainfall distribution and 9 mm fell at the beginning of the season enough to germinate their millet, but then no more rain for six weeks . Those with the hedges produced good crops those without produced nothing. The Village chief said that from now on everybody would use VS it was obvious it had pulled them through the "drought". To actually set up a trial to accurately measure the effects of moisture conservation behind vetiver hedges in a given catchment would be a hell of a factorial trial design needing many replicates and would it be worth the trouble. Maybe a straight comparison between with and without VS would be sufficient if you can show an increase in yield using VS, and replicate that over several villages. That would have more of an impact on the farmers".

"Galloping Horseman Trials – Comparative side by side demonstrations that can be seen and appreciated whilst galloping past on a horse (or nowadays a car!)"

"When I was running dozens of field trials for the Sugar Company, the simpler a trial was, the more effect it had on the growers. Our senior scientists used to come across (to Fiji) from Sydney HQ, inspecting our work, and say "Why don't you split that trial with another element? - fine for us but you lose the farmer if you make it too complicated. That's why my forestry work in India was so successful, the only factor I changed in that equation was contour V ditching for moisture conservation - everything else was a repetition of what they had always done.

You have got to keep the inputs simple - it takes a long time - getting the importance of moisture conservation across to rain-fed farmers will take time - once we get that across, we can move on to better seed varieties - and then in 6 growing seasons, fertilizers. Move at a speed the farmer can see and understand the benefit of each technology, otherwise you lose him."

Convincing Farmers

"How to set up a "generic" VS evaluation – Attached are photos (slides) I took in the early 50s (now faded) of the erosion problem we faced in Fiji when I started the VS – the worst gullies we filled with the Bull dozer , and then planted vetiver across, when Paul inspected the cane areas recently, I would bet he never saw any erosion especially like this – VS had put a stop to it. But – now things have changed! Why are the young Fijian cane farmers not persevering with VS today? Because when I was there, all the cultivation was done with Oxen and along the contour, was easier on the bullocks than up and down the slope – Now they all have tractors and it is safer and easier to plow up and down the slope than along the side of a steep hill. But the main reason is that since Independence – the Indian farmers have lost their land to the local Fijians who they rented it from - the Sugar Mills are in such bad repair I give them only a couple more years before they are forced to close. The 400 miles of railway we maintained to get the cane to the mills has been totally neglected to the point it has virtually disappeared, the rail bridges have been wiped out by hurricanes and not replaced or repaired – the few cane farmers left as tenant farmers couldn't care less about erosion. To get subsistence farmers to accept VS, all the research in the world is not going to have the slightest impression on them. Ultimately It may convince the 'establishment' that VS works, but farmers generally, are not interested in the results from fancy lysimeters at research stations. So what do we have to do? We told the farmers that we had a simple system that would increase their yields by at least 20% at little cost - this would mean more money in their pockets. We never mentioned soil conservation, or only mentioned it in passing. In the Sugar Company, we had a Mobile Cinema Unit mounted on a Land Rover, which was extremely popular – we made 16mm films (horribly complicated process then) of VS at work, with farmers they knew and could relate to in the film – we showed cartoons for the 'kids', the Film Unit was very popular. At the end of the show we called for volunteer farmers to try VS on their farms and always got 6 or 7. The Mobile Cinema Unit travelled to all the most out-of-the-way villages. We brought out our team to plant the hedges and told the farmers that we would compensate them if their vetiver hedged fields yielded lower than normal.- we never had to pay compensation as it turn out. In today's situation, you would have to put in comparative 'trials' farmers with VS and farmers without - and the most important measurement would be weighing the yields from comparative areas. Farmers have got to see for themselves the difference a new technology makes, what it costs, how much work is involved in maintenance – what else can the vetiver grass be used for, apart from conserving moisture in the soil – we know the answer for that. The farmers themselves know the difference between VS and all other forms of conservation. VS is the only system we would install to increase yields – all the other systems are for soil conservation, which they can see no value in. I think we should remember that we are trying to impress the farmers. There you are, something to chew over".

On Development Organizations

"If we want to alleviate poverty in the developing world, then we must stop measuring the problem and do something about addressing it. For the past 80 years we have been measuring the problem of erosion, the largest factor in the rural poverty equation. We have even developed an equation for soil loss: "..... As additional research, experiments, data, and resources become available, research scientists continue to improve USLE, which led to the development of Revised Universal Soil Loss Equation (RUSLE). RUSLE has the same formula as USLE, but has several improvements in determining factors ". This is an absolute nonsense. A man on a galloping horse can see we have a problem with erosion. We do not need to spend even more money on measuring it, nor on writing an equation for it. Historically, global development policy and its associated funding has been controlled by well-intentioned men and women, experts in their own field – philanthropists, accountants, lawyers, business people, economists, engineers, medical doctors, and even soldiers. When it comes to allocating money to alleviate poverty, obviously, being professional and business-oriented, they want to do 'due diligence' – and measure the problem first! Over several decades, I have noted that the politicians, the planners and quite often the Heads of the aid agencies, like to have development reports written in long academic prose with lots of formulae, bar charts and scientific data that they can present at yet another conference. The resulting academic papers from these conferences will be filed away, and the scientists will return to their bases with even more

new ways to measure poverty, ready for the next conference. Whatever their expertise, I have yet to work with one who has any useful field experience in agriculture. Years ago, I had a first-hand experience of this working in Viet Nam when the Planning Chief asked me “What is a contour? I am a medical doctor by training and don’t understand any of these terms. You people use these terms and you lose my staff completely to the point they are too embarrassed to even ask questions at the conference”.

“The paper “[Soil Erosion Threatens Food Production](#)” is exactly what I am complaining about in my latest tirade – These guys no matter how scientific or how nice they are, are always measuring the problem – nowhere in that paper of facts and figures is one suggestion on what should be done about this problem. I can get facts like that from the Economist.”

“V” Ditches

“The system I used in the Maheshwaram Watershed Project (India) was to take the government Caterpillar dozer (D6 120hp) that they were using, incorrectly, to shave off all the growth competing with their Eucalyptus planting – angle and tilt (their engineer didn’t know you could tilt the blade) the blade – this unit fortunately had a three tined ripper attached – so I ‘eye-balled’ lines across the slope, had the boys hold long sticks to mark that line through the scrub, then had the driver rip an even line round the slope, when he got to the end, turn the dozer round, and with the corner of the blade on the up-hill of the ripped line, create a “V” ditch with the angled and tilted blade by following the ripping round the slope – when he had created the first “V” ditch, turn round and rip another line parallel to the first but 5 meters apart – and so on. Their planting production using this method took a quantum leap from 7.5ha accomplished in 1985 using their hole digging system, to 255ha in 1986 using dozer ripped “V” ditches, to ultimately 800ha in 1989. The survival rate of their trees jumped from <20% to over 90%. A tractor of less than 100hp under the circumstances soil type and slope, just wouldn’t do it, and wheel tractors, just don’t even consider them – the Government has this equipment available, just get them to use it. Forget Vertical Interval, just run the “V” ditches parallel to each other 5 meters apart – don’t get too mixed up in technicalities of VI. --- The “V” ditch, works, trust me”.

Increasing rainfed crop yields

*“This is a perfect example of the point I have always made that the main problem with sustainable production in rainfed areas is not what the ‘College Farmers’ believe “..... the land has been stripped of its nutrients; soil erosion has been the major problem etc.” **wrong !!!** What has given this farmer his good crops of maize and sorghum is purely and simply moisture conservation using vetiver hedges across the slope, When will they ever learn???? I rest my case.”*

Pastures

*“In my long and varied career in the tropics, I was also involved in pasture improvement and was able to quadruple the carrying capacity of our ranch in Fiji, which was basically easy for me as I came from a background of high production sheep and cattle ranching in New Zealand. Let me put it simply, don’t waste your time trying to establish new pasture grasses as they will always play second fiddle to the native grasses which don’t have much nutritional value as they stand. But what you have to do to be successful is establish a tap rooted legume like *Macroptilium atropurpureum* ‘Atro’. The nitrogen fixed by such a vigorous legume greatly increases the nutritional value of the native grasses – so concentrate on getting a legume established, especially tap rooted. Buffel grass *Cenchrus ciliaris*, is always a candidate for the uninitiated in pasture improvement in the tropics. Exotic grasses, unless heavily fertilised will never compete in the long run with native spp.”*

“I was reading the latest Economist about “Taming the frontier” how Aussie wants to turn its most remote region in to an investment ‘hub’. I tried to get in to this back in the Fifties (when I was a young fella) with the West Aus Government and the Humpty doo mob in the Northern Territory, But nobody was interested, and they all failed anyway. But, here’s a chance for my Vetiver ‘long’ hedges to work – parallel vetiver hedges 10Km long planted 50 – 100m apart, across the slope in Grader constructed “V” ditches which would harvest the runoff and nutrients

from the massive runoff in those areas during the wet season. This would produce pastures that would vastly increase the carrying capacity of cattle in those areas and just love being burned, as fires are common throughout the territory. Right now that uncontrolled runoff creates hellish floods and erosion and is wasted. God I wish I was 60 years younger again!!!!!!”

Vetiver and drought

“For vetiver to handle the extremes of climate, I would suggest that it would have to be grown in its ideal climatic zone, which is 30° North and South of the Equator. Vetiver is a C4 plant and thrives on ‘sunshine’ if your growing season is in the colder months then the rainfall vetiver receives is not being used because vetiver grown outside the 30° zone has a period of dormancy and this may coincide with the meager rainfall, giving no benefit. My only suggestion is in the less than 200mm (8”) rainfall zone, in the tropics/subtropics, you would construct a wide “V” ditch to intercept runoff. In my experience in the Middles East, 6mm of rainfall in V ditches 8m apart put 30cm of runoff water in to the V ditch. Plant Vetiver in to this water from then on it will be harvesting its own water needs and nutrients from runoff. I grew Olives in Jordan using this system, they were very successful and had never been grown if this low rainfall zone before. Vetiver because of its deep root system, will utilize the moisture lenses in Sand dunes where other plants fail. I found that tropical arid areas conserve moisture better than temperate areas, but you need to have deep rooted plants to utilize this moisture. Finally, there is no useful plant known to man that is drought resistant. To make plants grow in dry zones you have to utilize the meager runoff.”