

Vetiver Grass





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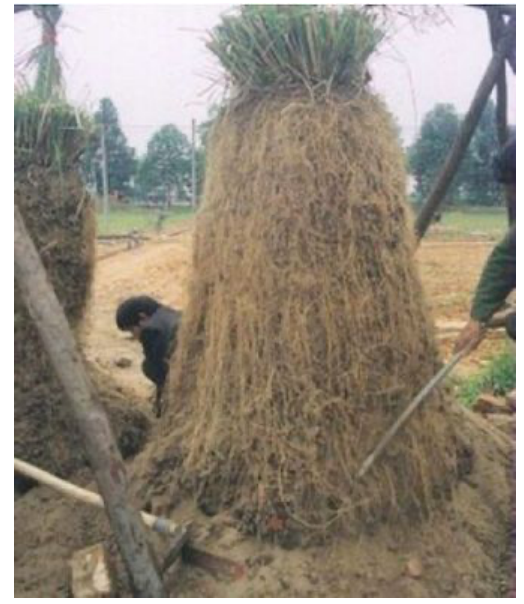
VETIVER GRASS

Vetiver (*Chrysopogon zizanioides* – registered as Monto Vetiver in Australia) is a fast growing perennial grass with a vast networking root system and strong erect stems, which together create a miracle plant with the ability to address an array of environmental, engineering, and industrial rehabilitation issues. The Vetiver System application of Vetiver grass has the ability to create living walls, filtration systems, and act as “living nails” reinforcement.

THE ROOT SYSTEM

The vast, penetrating and deep root structure of Vetiver grass, which can reach vertical depths of 5+ metres, fastens and reinforces the soil structure by up to 45%, protecting against erosion. The roots are extremely tough with a tensile strength of 75 MPa, which is approximately 1/6th of mild steel reinforcement. These properties make Vetiver a unique bioengineering tool, which has been successfully used for environmental and industry infrastructure purposes, disaster mitigation, resilience planning and asset protection.

The enormous and complex root systems of Vetiver grass also provide and create favourable conditions for soil microbial activity and growth in the rhizosphere of the roots (soil/space that surrounds the roots). This microbial activity and growth is essential for the removal of contaminants in soil and water, whilst also serving to increase soil fertility.



THE STEM NETWORK

Vetiver is a clumping grass with solid, strong, stiff stems, which rapidly form into dense hedges. These Vetiver hedges create natural barriers with an extremely high resistance to water flow. These hedges are capable of slowing down water flow, dissipating the kinetic energy. This in turn allows the system to control water runoff, trap sediments, stabilise and protect soil, and increase water infiltration and retention in the soil.



NON-INVASIVE NATURE

A vital aspect of the application of the Vetiver System is that Vetiver is non-invasive / sterile. Meaning although it flowers, it does not produce viable seeds. Along with its roots being non stoloniferous. Hence vetiver is unable to spread naturally without human intervention, meaning it has no weed potential. This in turn renders the Vetiver system to be moulded and utilised for specific function, without the threat of it spreading and becoming an invasive weed.

RESILIENT NATURE

Vetiver grows and thrives in a variety of soils: sandy, waterlogged, saline, acidic, alkaline and toxic soils (from pH 3.3 – 12.5). As well as being tolerant to pesticides, heavy metal toxicities and herbicide. Vetivers capacity to not only withstand these adverse condition but actually metabolise the toxic components and break them down. (bio-remediation).

Rehabilitating the land and reducing the concentration of the pollutants over time.

This coupled with its ability to withstand drought, flooding and fire once established lends to a highly functional plant.

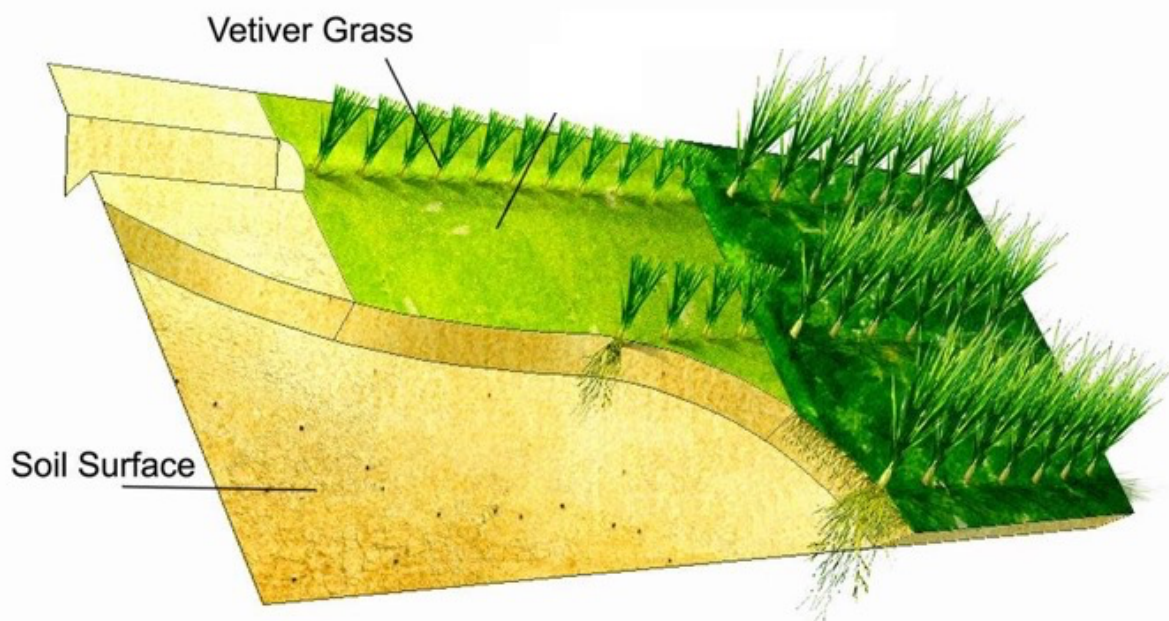
THE VETIVER SYSTEM

The Vetiver System is an environmentally harmonious, inexpensive, practical, low maintenance and effective approach to land regeneration and stabilisation, erosion and sediment control, soil and water conservation, and phytoremediation. Vetiver's inability to self-propagate allows for Vetiver to be shaped and utilised for the specific needs and requirements of the job at hand.

SOIL BIOENGINEERING: EROSION CONTROL + INFRASTRUCTURE PROTECTION.

Vetiver's roots and stems combine to work both in and above the earth to mitigate erosion, retain soil and water on site as well as stabilise steep slopes.

Beneath the surface the mat of both thick and thin interlocking and penetrating roots reach depths of 5+ metres.





When planted in Vetiver System hedgerows, these roots link up and create underground root walls which in turn bind, retain and stabilise the soil.

The robust, ridged stems create above ground hedges that when planted in hedge rows allow for the dissipation of energy from moving water. By Slowing the flow, it allows for the particles being carried by the water to settle on the high side of the hedge. While the liquid can seep through the stems and continue, at a slower rate and in a purer form towards the ocean.

Because of the extraordinary strength of the roots of the vetiver system it is very hard to dislodge, ensuring the longevity of the system.

Vetiver can resist flows of 5 metres per second, making it the perfect living tool for land stabilisation, protecting infrastructure, erosion mitigation and flood disasters.



ADVANTAGES OF VETIVER

- Regenerative
- Non-invasive

- Stabilises and strengthens soil structure, improving integrity of infrastructure
- Slows water flow, allowing for proper water infiltration
- Can withstand water flows of 5m/sec
- Long-term solution: gets stronger as it grows
- Traps sediments
- Exceptional resistance to high velocity water flows – thrives through storm seasons
- Carbon sink + onsite mulch production
- Erosion control – above and below the surface
- Drought resistant (once established)
- Survives flooding (up to 3 months fully submerged)
- Improves water quality – nutrient and toxicity removal
- Aesthetically appealing
- Creates grassland ecosystems
- Minimal ongoing maintenance costs
- Does best in full sun / exposed sites



EXEMPLARS OF APPLICATION



Left: large scale roadside slope stabilisation – Guatemala. Source – The vetiver network international.



Below: rural road stabilised with vetiver + dam cut stabilisation (northern rivers)

