

Vetiver Propagation in the subtropics

A pictorial essay by Evan Millwood

<http://www.vetiver.org> – <http://www.erosionqld.com.au>

Vetiver, *Chrysopogon zizanioides*, is a sterile, clumping C4 grass that originated in India with approved cultivars having spread throughout the globe, mostly in tropical and semi-tropical areas. Applied as the *Vetiver System* (VS) and guided by *The Vetiver Network International* (TVNI), the *Vetiver System* is predominantly used in the following applications:

- farm soil and water conservation;
- slope stabilisation of public infrastructure (e.g., roads, railways, canals, rivers, construction);
- prevention and treatment of contaminated domestic and industrial waste water;
- reclamation of toxic mine-tailings and polluted industrial land;
- disaster mitigation (e.g., stabilising potential landslide sites, dikes and levees, dampening wind scour, and area protection against flooding);
- soil improvement, wetland and marginal land restoration, and crop pest control;
- renewable natural fibre for handicraft production, mulch, and thatch, etc.
- bio-fuels

Source: <http://www.vetiver.org/>

This document is a pictorial guide to one very common low cost method of propagating Vetiver for one type of application in the *Vetiver System*, usually unbroken hedgerows planted on or near the contour lines for soil and water conservation. For further information on propagation methods or more advanced planting applications, please visit the [Vetiver Website](http://www.vetiver.org/). For updates and discussion, use the [Vetiver Blog](#) and [Vetiver Facebook Group](#).



A vigorous 4 year old rainfed Vetiver clump in the author's garden with a post hole shovel for scale.

1. The Nursery

A Vetiver nursery can be sited on most soil types and will prefer a sandy soil for ease of digging during the propagation phase. A moist and fertile site is recommended but Vetiver is very adaptable and growth will most likely be sufficient in less desirable situations. Water can be supplied through drip lines, overhead irrigation, manual watering, or rainfed. A full sun to part-shade aspect is required with full sun being preferred. In the subtropics, the active growth phase is limited to the warmer seasons, Spring to Autumn; take note that growth and propagation timing will be different to the tropics and yield will be reduced. Spacing ideally will be 50cm apart in rows or a grid, some drip irrigation setups will have 2 plants per dripper or some strips can be planted in double rows. A basic nursery can be extremely easy to setup and will require no special conditions other than access to sun.

Recommended for a Nursery:

- Full sun
- Fertile
- Irrigation
- Sand or sandy loam
- Correct spacing



A rainfed nursery in a depression with plants in varying stages of growth as they are removed and replaced. Notice clumps that have been trimmed versus untrimmed. Trimming may accelerate tiller formation when performed at the right time.

2. Propagation using slips

Propagation using bare-root slips is the simplest and most cost-effective way of creating planting material for use in the *Vetiver System* (refer to the [website](#) for other methods and reasoning for using them). Propagation in the subtropics must be conducted from Spring to early Autumn which coincides with the wetter season in most subtropical locales. Do not propagate, plant, or transplant Vetiver in late Autumn/Winter as the results will be poor. Clumps are best divided from 4 months to 2 years old. Older plants will have hard woody crowns just below the surface and are difficult to remove from the ground. The pictures below serve as a guide for a method to divide 4 year old plants on the dry side of the nursery. Younger plants may divide easier and will have less of a crown.

Steps:

- Cut the leaves of clump for easier management. Cut to approximately 40-50cm above the ground surface initially. An initial high cut will allow you to more easily hold on to the clump when the division begins without damaging the final material. The final cut will be at 20cm in length. Initial cutting of the plant can be with secateurs (pruning shears), machete, brushcutter, hedgers, or a serrated grass sickle as pictured below.



- Dig up the clump. A shovel-like tool can be used to sever roots just below the crown and pry the clump from the ground. Dig around the clump on an angle and begin to pry to check looseness as you move around. Take care to not cut into the crown of the plant at this stage to conserve potential propagating material.



- The clump has been severed and pried from the ground. Cut the soil away from the sides carefully and try to leave about 5cm of root under the crown.



- Break up the clump into smaller pieces. Grabbing a 'natural' group of tillers (usually a handful), stand on the end of the clump and lift/tear the group away from it. The bigger or older the clump, the harder this is to do with just your hands or feet. Repeat this process around clump until the plant is divided or you are unable to divide any more using this method.



- The 'group' of tillers in your hand has come free from clump with some minor damage to roots (the plants will not suffer). Knock the soil away from the roots. I use the back of the shovel over where the clump was removed from to replace any missing soil from hole.



- Divide the group into individual plants (slips) of 2-3 active tillers (either grass leaves and/or stems). They will naturally divide into small groups, just locate where and pull them apart.



- Cut the tillers to approximately 20cm in length. If there is a visible node on any woody stem near to 20cm, cut above to retain it. The mature node on the stems can also be used to propagate plants and if this method is used, cut it off and transplant it (see [website](#)). This mature part can be used by the plant to regrow if it's covered with silt in the field before being fully established. Cut the roots to about 5cm if it's required.



- Older plants will have a dense woody crown and may require slicing apart to break it up to usable pieces as you may not be able to do this with just your hands/feet alone. Use a sharp edged tool to cut the crown apart in a spot you feel won't damage too much material. Do not worry if you are not accurate, it is inevitable that some potential tillers will not survive being split off of the crown due to excessive damage.



- Continue this process until the entire clump is divided. I prefer to complete this process from where the plant was removed so as to mulch the area for replacement plants. I plant the replacements beside or around the original hole.



- This stage is important in this location as there is a common weed, Nutgrass - *Cyperus rotundus* and the nuts (root nodules) must be removed from the propagation material to prevent unwanted infestation in a new location. It is easy to tell when there are other weeds in the Vetiver at this stage. The slips are soaked and roots agitated in the water, then checked again to remove any foreign bodies or other plants.



- Remove the dead leaf sheaths from each group of tillers, exposing the green plant parts for improved photosynthesis later on when replanted. Be careful as any small brand new shoots are fragile at this stage and can be broken off accidentally (pictured).



- A cleaned slip. Continue this process on other slips, trying to remove the majority of dead material. It doesn't have to be perfect and after doing this for a little while you will know easily how to arrive at what is in the picture below.



- Continue to divide to 2-3 active tillers per slip if missed in the earlier step. It is very easy to break or twist these units apart with your hands.



- Whilst you are attempting to maintain 2-3 tillers per slip, some will naturally divide themselves into single tiller slips or sometimes it is due to user error. It is more desirable if they have large crown pieces attached to a single tiller. These singles are statistically less likely to thrive but are still viable. They can be potted on and cared for or added to a 2 tiller slip in the field (planted in same hole). Combining single units into units with 2-3 tillers is easy to do during the planting process.



- The picture below is a plant part seen in older or mature clumps. A node on the stem (flower stem) will begin to send out roots and new leaves inside the clump, often above the soil surface, surviving on the moisture inside of the dead or shaded areas. This is an example of natural node propagation in situ and this is how Vetiver will continue to grow “up” the vertical wall of soil and silt that backs up behind the hedge over time.



- Older crown pieces, with or without active tillers, can easily produce new shoots. You can place them under damp conditions or plant them out immediately into the ground. These pieces will be used to replace the clump that was removed originally from the propagation area. They can be used in the field but they produce new shoots more slowly than do transplanted slips and the unusual size to each piece can reduce spacing efficiency in hedgerow installation.



- Uniformly-sized propagation material cleaned and ready for the next stage. This clump yielded 55 tillers (singles added as 0.33-0.5 depending on their size). A healthy irrigated and fertilised 2 year old clump could yield similar results. Some 4 year old clumps will yield 70-80 but the addition of extra labour does not make this economical to pursue. This is climate and site dependent.



- Slips can be soaked in water for 4-7 days with water replacement every 2 days and will most likely develop new roots during this time. This increases survivability in the field. Using a rooting hormone or animal manure tea in this stage can also be beneficial. Plants can be immediately planted out using the techniques detailed in the *Vetiver System* if irrigation or soil moisture is available. Visible new roots will be white in colour.

