

The promotion of vetiver grass cultivation for soil and water conservation by farmer's participation

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Abstract

Wichai Tuay-ha, A farmer who migrated from the northeast to the southern of Thailand, has turned his dryland which caused by growing cassava in the northeast to be an orchard in the southern. However, he still has problem for his farming because of the soil erosion on his sloping area. After he had been through many processes, problem of soil erosion on sloping area still occurred on his land. In 2003, Ranong Land Development Station's officer suggested him to solve his problem by growing vetiver grass in the orchard. At the first sight, Wichai was interested because of an advantage of preventing loss of chemical fertilizer. By that time, his knowledge and understanding about soil conservation and soil fertility was inadequate. He only knew that this grass has been widely used as a biological measure for erosion control. After doing his research, Wichai has concerned there are a lot of benefits that he could receive from it. Since that, he started to cultivate 45,000 vetiver grass on his land with his diligence and intention. Now his orchard becomes a learning centre and has number of vetiver grass more than 600,000. Presently, Wichai is one of many farmers in Thailand who adapting sufficiency economy theory to his life. He is conscious that a main principle of farmer's life is to understand obviously different between need and imperative. Apart from that concern, he attended to learn more about organic farming system. He started growing the vetiver grass in an inverted semi-circle on sloppy land outside of fruit trees shade and along the contours parallel by aisle of rubber trees. From the first notion of trying to grow vetiver grass to prevent the loss of chemical fertilizer, he has received so many unexpectedly benefits from that trial. He gradually detected that the soil erosion and runoff in his orchard were decreased. The output was increased, while the usage of chemical fertilizer was reduced. Furthermore, vetiver grass leaves can be used as mulch to cover the soil, reduce water evaporation from soil surface, enhance soil moisture and support cultivation in drought. On the other hand, mulching is used to restore deteriorated land by enriching the organic contents and also produce the compost fertilizer. Now, Wichai is currently a volunteer for the Land Development Department. He relays his knowledge from his own experience to other farmers. The difficulty of encouraging farmers to plant the vetiver grass in their farms is they are not able to evaluate any economical benefits from it. However, Wichai's success is a significant evidence to prove the value of vetiver grass. Today, more than 100 farmers from Ranong province and nearby area come to his learning center to get knowledge about vetiver grass and organic farming system.

Key words : vetiver grass, soil and water conservation, farmer's participation

Introduction

The deterioration of soil in Thailand starts to be continually severe because of inappropriate using soil resources. Deforestation causes soil erosion, resulting in low crop yields and farmers having harsh life. There are lots of expensive methods for controlling soil erosion and land degradation. Vetiver grass is now being used world-wide as a low-cost, low-technology and effective means of soil and water conservation and land stabilization (Truong, 1993). This auspicious plant is another way of using nature to take care itself. The King of Thailand has paved the way to have it studied and experimented for soil and water conservation since 1991. Vetiver grass (*Vetiveria zizanioides*, L. Nash) is a tall (1-2 m), fast-growing, perennial grass which form a dense hedge when planted

closely in rows. Vetiver grass is native to south and south-east Asia where it has been grown for centuries for its aromatic oil (from the roots), roof thatching and fodder for livestock. Vetiver grass was first used for soil conservation and land stabilization purposes in Fiji in the early 1950s (Truong and Scattini, 1990). Vetiver grass hedges have the morphological and physiological characteristics that are ideal for the purposes of soil and water conservation. The plant has stiff erect stems and a fast growing extensive root system (up to 3 m deep in 12 months). New shoots and roots will grow readily from its base when buried in sediment. Vetiver is tolerant to extremes in temperature (- 10° to 48° C in Australia), soil moisture and soil acidity and alkalinity (pH from 3.3 to 10.5). The plant also adapts to adverse soil conditions such as Al and Mn toxicities and high soil salinity and sodicity (Dalton et al., 1996). However, the promotion of vetiver is not accepted by farmers because lack of a clear understanding of what is its advantages. Farmer's participation was very important because farmers were beneficiaries and also workers. If farmers are not convinced prior to introducing a new technology, it is absolutely sure that they will devastate it after a project is phased out. Farmer-to-Farmer extension has certainly been very effective with regard to vetiver grass. After everybody gets motivated and a positive sense of competition is created.

Wichai Tuay-ha, one of strong volunteer farmer "soil doctor" of the Land Development Department, Ministry of Agriculture and Co-operative of Thailand, works as an extension officer by providing knowledge on the vetiver grass and land development according to the principles of the sufficiency economy.

The use of vetiver grass

Wichai Tuay-ha started his own farm by growing cassava in the northeast of Thailand. In that time, he was interested to chemical and pesticide usage. It made his agricultural area to be gedradation and reduce production. Wichai migrated to Ranong province by his friend suggestion and started to planting coffee trees in this sloping area. He continued to use chemical and pesticide. Later, his new agricultural area was deteriorated again. He found that his attempts to grow tree crops on sloping area was wasteful because the resulting poor, uneven stands are not worth the cost of maintenance. Moreover, he found others problem , it was "soil erosion". Soil erosion in agricultural systems is a very important problem to manage. When the topsoil layer is eroded away, then the ground is very unproductive in producing crops. Wichai found a number of different methods of reducing soil erosion. He found out was what the most effective method for his area. Until Ranong Land Development Station's officer suggested him to solve his problem by growing vetiver grass in 2003. At the first sight, Wichai was interested because of an advantage of preventing loss of chemical fertilizer. By that time, his knowledge and understanding about soil conservation and soil fertility was inadequate. He only knew that this grass has been widely used as a biological measure for erosion control. After doing his research, Wichai has concerned there are a lot of benefits that he could receive from it. Since that, he started to cultivate 45,000 vetiver grass on his land with his diligence and intention. Now his orchard becomes a learning centre and has number of vetiver grass more than 600,000. Presently, Wichai is one of many farmers in Thailand who adapting sufficiency economy theory to his life. He is conscious that a main principle of farmer's life is to understand obviously different between need and imperative. Apart from that concern, he attended to learn more about organic farming system. He started growing the vetiver grass in an inverted semi-circle on sloppy land outside of fruit trees shade and along the contours parallel by aisle of rubber trees. From the first notion of trying to grow vetiver grass to prevent the loss of chemical fertilizer, he has received so many unexpectedly benefits from that trial. He gradually detected that the soil erosion and runoff in his orchard were decreased. The output was increased, while the usage of

chemical fertilizer was reduced. Furthermore, vetiver grass leaves can be used as mulch to cover the soil, reduce water evaporation from soil surface, enhance soil moisture and support cultivation in drought. On the other hand, mulching is used to restore deteriorated land by enriching the organic contents and also produce the compost fertilizer.



Figure 1 : Growing the vetiver grass in an inverted semi-circle on sloppy land outside of fruit trees shade



Figure 2 : Growing the vetiver grass along the contours parallel by aisle of rubber trees



Figure 3 : Planting vetiver grass to protecting roadsides



Figure 4 : Use vetiver leaves as a mulching material



Figure 5 : Use vetiver leaves as a compost material



Figure 6 : Vetiver makes good bedding for livestock because it soaks up the urine and stays dry longer

The Promotion of Vetiver Grass by Farmer's Participation

More than 134 million rai of land all over the country is severely eroded. His Majesty the King has realized this great problem and suggested the use of vetiver grass to help soil and water conservation. This type of grass could be easily cultivated by farmers. It needs no complicate technology to maintain and very economic to use. Land Development Department has collected and distributed the information on vetiver grass researches to farmers and governmental personnel. Strains of vetiver grass are selected and propagated for farmers and working units to use. However, the promotion of vetiver is not accepted by farmers because lack of a clear understanding of what is its advantages. Farmer-to-Farmer extension is one of effective method to promote vetiver grass.

Wichai Tuay-ha, as a volunteer farmer "soil doctor" of the Land Development Department, works as an extension officer by providing knowledge on the vetiver grass and land development according to the principles of the sufficiency economy. From his own success, Wichai want to tell his experience to other farmers, then he decided to make his farm to be learning center. Wichai thinks that knowledge from the experience is better than the demonstration, so he teach the farmers who visit his learning center to do something by themselves - for example, he will teach the farmers who want to get the vetiver grass stalks for planting to dig it out by themselves. The objectives of the learning center is

- To produced and distributed vetiver grass stalks to the interested farmers to grow at their areas.
- To demonstrate and provide information to farmers on how to make the best use of land and water, as well as how to revitalize the unfertile soil.
- To make the farmers well aware of the importance of soil and water conservation, an positive approach to disseminate information on how to use the land properly and the return benefit in the long run must be clearly demonstrated.



Figure 7 : Wichai Tuay-ha and his learning center

Conclusions

Farmer-to-Farmer extension is one of effective method to promote vetiver grass. The demonstration sites as a learning center will help the farmer well aware of the importance of soil and water conservation. The government officer may be only the advisor who give them the new knowledge and budget for the success of the promotion of vetiver grass cultivation for soil and water conservation by farmer's participation.

References

- Dalton, P.A., R.J. Smith and P.N.V. Truong. (1996) Vetiver grass hedges for erosion control on a cropped flood plain: hedge hydraulics *Agricultural Water Management* 31 : 91 - 104.
- Truong, P.N.V. 1993. Report on the International Vetiver Grass Field Workshop. Kuala Lumpur. *Aust. J. Soil Water Conserv.* 6 : 23-26.
- Truong, P.N.V. and Scattini, W. 1990. Vetiver - The Hedge Against Erosion?. *Aust. J. Soil Water Conserv.* 3 : 16-18.