

A NEW FARMER'S EXPERIENCE ON THE USE OF VETIVER GRASS FOR SOIL AND WATER CONSERVATION ON FARMLAND

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Abstract

A technocrat-turned-farmer at the Khao Hin Son sub-district of Phanom Sarakham district, Chachoengsao province, who started his farming career only two years ago, has discovered that vetiver has several characteristics which help him to conserve his soil, which is deteriorating due to a high rate of soil erosion. Planting hedgerows of vetiver along the slopes, semi-circling along the fruit trees, and along pond banks has yielded positive results: erosion has almost stopped, the fruit trees have started growing vigorously, the land has become more fertile, and the water in the ponds is clear and clean.

Introduction

An inexperienced farmer who used to be a university lecturer, together with his wife who used to be an executive in an investment company, decided to do farming to satisfy their love of nature. They bought a piece of land in the Khao Hin Son sub-district of Phanom Sarakham district, Chachoengsao province, with a total area of 35 *rai* (5.6 ha), and started to do farming.

Since the farm is located in a sloping area with very infertile sandy soil (due to severe erosion of the topsoil in the past), low soil moisture, and lack of water source, it is necessary to dig farm ponds to collect water during the rainy season for use in the dry season. To enhance such an operation, growing vetiver along the contour lines, banks of the ponds, as well as in semi-circles around the fruit trees, was suggested by the Khao Hin Son Royal Development Study Centre. The objectives of such operation are: (i) to conserve and protect the topsoil from being eroded, (ii) to trap sediment and to prevent the collapse of pond ridges during the rainy season, and (iii) to increase soil moisture and the fertility of the farm.

Operating Sequence

The following sequence has been operating since the beginning in 1997:

1997 - Digging two farm ponds (1 200 m³ each)

1998 - Planting vetiver along the ridges of the newly dug ponds

- Making compost from rice straw

- Consolidating the land

- Planting fruit trees

- Digging another pond (1 200 m³)

1999 - Consolidating the remaining land

- Planting vetiver along the ridges of the newly dug pond

- Planting vetiver as semi-circles around fruit trees

- Planting vetiver along the contour lines within the farm

- Enriching the soil by applying compost and farm manure

Proposed plan for the year 2000

- Planting vetiver along the natural gullies

- Repairing missing clumps along the ridges, contour lines, and semi-circle hedgerows

Operational Activities

The following activities have been done:

1. Requesting vetiver planting materials from the Khao Hin Son Royal Development Study Centre to plant according to the sequence above. Two hedgerows were planted at each site. It was observed

that such hedgerows have mitigated soil erosion, especially on steep land, like the filled-in land on which the house is built.

2. Collecting organic matter from cut grasses, farm manure, garbage, etc, to make compost, using a “starter” obtained from the centre.

3. Making land consolidation by using a tractor in order to make weeding easier. No tillage is done within the farmland once land consolidation has been completed, thus allowing natural grass to grow with the help of vetiver hedgerows along the contours. No chemical pesticides have been used; instead, biological control and botanical pesticides have been employed when necessary.

4. Planting mango trees (Nam Dok Mai and Khieo Sawoei varieties) alternating with several other fruit trees to diversify the orchard based on the concept of growing several species of plants to avoid the danger of blights and insects.

5. Planting vetiver hedgerows along the contour lines in the orchard in order to protect erosion of the topsoil; each contour is planted with three rows, with interval spacing between contour lines of 15 m.

6. Planting vetiver as semi-circles around the fruit trees, facing upward to trap sediments running along with water from a higher level. Such an operation has resulted in the build-up of soil moisture and nutrient at the base of the fruit trees. During the rainy season, cutting of vetiver leaves is done once a month; the cut leaves are deposited at the base of the fruit trees for natural decomposition.

Problems and Solutions

The main problem is the high expenses incurred in the operation, such as wages for digging ponds and hills for planting fruit trees, and cost of fertilizer. The lack of capital has caused some delay in the operation, so that the vetiver was planted quite late in the season, resulting in the death of some trees during the dry season. With the help of the centre, the situation has improved, and it is planned to proceed with repairs during the next rainy season.

Results of the Operation

Although it is a little too early to see the beneficial effect of vetiver on the general performance of the farm, it can be stated with confidence that the result has been satisfactory so far. This is especially true when soil and water conservation is taken into consideration. Furthermore, the practice of organic farming has resulted in the balance of nature. The following observations have been made with respect to the beneficial effects of growing vetiver:

1. Vetiver planted as hedgerows on the ridges of the ponds has reduced the damage of the sandy soil being washed away by running water. Moreover, the water passing through the vetiver hedgerows into the pond is clean and clear. This phenomenon is in contrast with the previous situation when there were no vetiver hedgerows; the water was full of sediment and appeared an opaque white. Along the contour lines, the front hedgerows accumulate a lot of organic matter and slow down the runoff water.

2. No tillage cultivation on sloping land with a sandy soil base is done. The natural vegetation is cut, but the soil is not tilled. The cut leaves, when left at the site where they were cut, have helped in accumulating organic matter and improving soil fertility. It was observed that earthworms have started to grow in such soil where none were found before.

3. Avoiding the use of herbicides helps to increase the growth of natural grasses, which in turn nurture the growth of natural predators and parasites of crop pests. It was observed that there were a lot of pests attacking fruits earlier, but almost none at present with not a single spray of insecticide.

Conclusion

The benefit of growing vetiver as hedgerows along the contour lines, in semi-circle around the fruit trees, and along the ridges of the farm ponds cannot be quantified in cash terms because it is too early to see the effect on the yield of fruit. However, the reduction of operating costs in making the soil more fertile and not using any chemical pesticides represents a real saving. Once the soil is enriched with organic matter with plenty of natural enemies of crop pests, it is anticipated that plenty of quality fruit will be harvested in the next season.