# Appropriate Spacing of Natural Vegetative Filter Strips (NVS) as Foundation for Agroforestry System

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES
Correspondence:
Mercado, A.R. Jr, and L. Laput

## Introduction

- Soil erosion from sloping farms exacerbated by inappropriate farming practices ranged from 50-370 tons$^{-1}$ yr$^{-1}$. (Mercado, et al. 2002)
- Upland crop yields declined 200-500 kg/ha$^{-1}$ (Fujisaka, et al. 1988)
- River systems in South East carry 10 times more sediment out to sea than any other river systems globally.
- Conventional spacing of vegetative buffer strips is at 1 meter vegetative drop. This entails crop area taken away from crop production which dramatically reduces farmers' willingness to adopt.

(left photo) More than 2000 farmers in Claveria are currently using NVS or grass strips to sustain crop production on their sloping fields. Many of these NVS usually evolved from the planting of timber or fruit trees and fodder grasses on the strips in an agrosilvipastoral system: Food Crops + Tree + Fodder (Photo at right). Establishing perennials on the NVS provides additional income to farmers.

## Objective

To determine the optimum spacing of NVS which is effective in controlling soil erosion and with the least reduction of cropping area.

## Methodology

An experiment was conducted at sloping farm of MOSCAT, Claveria, Misamis Oriental, Philippines with the following treatments:

**T1** No natural vegetative filter strips (NVS) as control
**T2** One (1) NVS in the middle of 50 meters long slope spaced at 24 meters apart or 8 meters vertical drop
**T3** Three (3) NVS spaced at 12 meters or 4 meters vertical drop
**T4** Fifteen (15) NVS spaced at 3 meters apart or 1 meter vertical drop

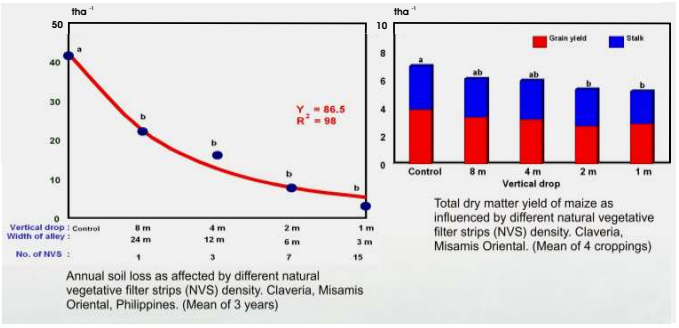
These treatments were laid out in randomize complete block (RCB). Design with 3 replications in 60% sloping farms. 50 cm. Wfide strips were laid out with natural vegetation left unplowed along the contour.

The natural vegetative buffer strips spacing experimental field in a 45 % slope located in MOSCAT Campus, Claveria, Misamis Oriental. This also features the erosion monitoring device, the tipping bucket method (sediment through and tipping bucket), to monitor eroded soils and run-off water, and the raingauge.

## Results:

| Treatments | Vertical Drop (m) | Alley Width (m) | Crop area Loss (%) | Maize row spacing (cm) | Pruning labor (mandays ha$^{-1}$ cropping $^{-1}$) | Slope (°) | Embankment (cm) |
|---|---|---|---|---|---|---|---|
| T1 – no NVS | - | - | | 69 | - | 23 | - |
| T2 – one NVS | 8 | 23.92 | 5.80 | 73 | 3.5 | 19 | 107 |
| T3 – three NVS | 4 | 11.92 | 8.69 | 76 | 10.7 | 18 | 103 |
| T4 – seven NVS | 2 | 5.98 | 11.59 | 77 | 15 | 13 | 89 |
| T2 – fifteen NVS | 1 | 3.00 | 17.39 | 81 | 29 | 8 | 75 |

Vertical drop, alley width, crop area loss, maize row spacing, hedgerow spacing, pruning labor required, change in slope* and embankment (accumulation + scouring)* as influenced by different natural vegetative filter strips (NVS) spacing in an acid upland soil. Claveria, Misamis Oriental, Philippines.




Annual soil loss as affected by different natural vegetative filter strips (NVS) density. Claveria, Misamis Oriental, Philippines. (Mean of 3 years)

Total dry matter yield of maize as influenced by different natural vegetative filter strips (NVS) density. Claveria, Misamis Oriental. (Mean of 4 croppings)

Natural terrace formation can be rapid due to frequent animal tillage and water induced soil movement. Land preparation on the developed terraces becomes easy.

## Summary and Conclusions:

- NVS are simple to establish.
- Too close NVS spacing removes considerable area from crop production, requires more labor to maintain, and lowers crop yield.
- It is more appropriate to space NVS at 2-4 meters vertical drop (8-12 meters apart).
- Wider spacing of NVS provides better foundation for farmers to plant trees without severe negative effects from trees.

**For more information:**

**Claveria Research Site**
MOSCAT Campus, Claveria Misamis Oriental, 9004
Mindanao, Philippines
Telp/Fax # (08822) 720964