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Key words: energy circuit models, fruit trees, ideal Holdridge diagram, income generation, nut trees, ornamentals, riparian buffer

Abstract. The creation of riparian forest buffer zones for water quality management in agricultural landscapes takes land out of production, incurring an economic loss for the landowner. However, planting and harvesting techniques, such as those employed in indigenous systems of tropical agroforestry, can enhance riparian forest buffer strips with economically viable species. This kind of riparian forest buffer can be harvested and generate income from otherwise unproductive tracts of land. This practice would make the implementation of riparian forest buffers more acceptable to farmers, by generating income while helping to improve water quality. The present project provides an economic model for the harvest of non-timber products (fruits, nuts and ornamentals) from riparian forest buffer zones in the Chesapeake Bay region. Potential gross income from harvest is calculated to demonstrate the feasibility of this strategy. Given certain assumptions, the gross income can amount to $60,934.30/ha/year.

Introduction

Riparian forests are an accepted best management practice in agricultural landscapes. These forests serve as a buffer between cropland and streams or rivers with the capacity to sorb excess fertilizers, pesticides and sediments from agricultural runoff. The sorptive capacity of riparian forests has been judged to be especially important in the Chesapeake Bay watershed where these forests are a recommended option for control of nonpoint source pollution (Lowrance et al., 1995; Forestry Work Group, 1993). Other benefits from riparian forests include such functions as flood peak attenuation, wildlife habitat and timber production (Odum, 1978). Riparian forests also affect the physical and chemical environment of streams by providing shade, detritus and woody debris (Lowrance et al., 1995).

In spite of their positive features, riparian forest buffers have been resisted by some farmers (Anonymous, 1993). Buffers take land out of production and can lead to lost income for farmers. Even though certain state programs provide grants to farmers who set aside forest buffers, the money 'falls far short of the lost income' (Anonymous, 1993). Also, timber production from riparian forests accrues at too long a time scale to balance the lost income. The purpose of this paper is to demonstrate another strategy for generating