Simulation of Agroforestry Using SCUAF Model in Czech Republic Condition

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Abstract

Agroforestry may be one of a few realistic ways of sustaining forestry production on agriculturally pressured forest land. Agroforestry is a collective name for land-use systems and practices in which woody perennials are deliberately integrated with crops and/or animals on the same land management unit. Agroforestry has attracted lately great attention, verging almost to become a panacea for many tropical lands, particularly for marginal areas.

SCUAF (Soil Changes Under AgroForestry) is a computer model which predicts the effects upon soils of specific land-use systems under given environmental conditions. It is designed to include the distinctive features of agroforestry. The model simulates, on an annual basis: changes in soil condition and the effects of soil changes upon plant growth and harvest. SCUAF represents a tool for tracing the linkages between soil processes (including erosion) and physical outputs.

SCUAF is not a plant growth simulation model. The user enters the initial rates of plant growth (trees, crops, and their component parts) as biomass increase per year. The model then estimates the effects of changes in soil properties upon subsequent rates of plant growth. The soil conditions and processes covered are: soil erosion, its rate and effects; soil organic matter, represented as carbon; plant nutrients: nitrogen and phosphorus; tree/crop competition for nutrients.

SCUAF is primarily intended to simulate agroforestry systems in tropics and subtropics. The previous applications of SCUAF give confidence in the model. They were done in South-east Asia and Africa. The last version 4.0 includes also default values for temperate zone. I used this computer programme to simulate an agroforestry system under the condition of Czech Republic to prove its reliability in the temperate condition. The final results will be published in autumn 2002.

Keywords: Agroforestry, SCUAF

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