C3.1 - Soil Use and Management

C3.1.1 - Recent advances in terroir zoning, functioning and sustainability

(9707 - 372) Advance in automatic measuring tool of soil losses using water environment research equipment ISCO 6712 Model

Tae-young Kim[1]; Yeong-Gyu Lee[1]; Gye-Ryeong Bak[1]; Sam-Nyeo Ji[1]; Dong-Shig Oh[1]; Gye-Jun Lee[1]

Rural development administration[1]

In soil loss research work in-situ timely correct measurement for loss quantities is a hard task. The rain is suddenly coming on and its intensity is changeable every moment. On-time automatic measurement of soil losses accordingly with such a raining occurrence is really laborious and complicated. In environment-friendly agriculture research laboratory of Korea Highland Agriculture Research Institute, the automatic measuring technology of soil losses was developed using compositive water environment research equipment ISCO 6712 Model(made in USA) over the year of 2015 and 2017. Soil losses are automatically measured as follows; Site Area; 1 × 5 ㎡, Planting Crop; Maize(planted density, 60×25 ㎠), Site Soil; Saprolite(Loamy Sand), Rainfall and Run-off Water Level Measurement; Rain Gauge and Bubbler Hose attached to Model No. 6712 Equipment, Automatical Suspended Water Sampling; Automatic Catching of Suspended Water by a Sampling Bottle connected to each horizon of Water Reservoir. The expectable accuracy for soil losses quantification measures up to the goodness of 75% and 95% in the ratio of estimate to occurrence quantity in a storm of rain 201.3㎜ and 82.6㎜, respectively.

Keywords: soil loss, ISCO 6712, maize

Financial support:

(1038 - 603) African soil partnership implementation plan for addressing the challenges of sustainable soil management in the sub saharan africa

Victor Okechukwu Chude[1]

Chairman, African Soil Partnership Steering Committee National Program for Food Security Federal Ministry of Agriculture and Rural Development. Abuja, Nigeria[1]

Land is the main resource base for many people in Sub-Saharan Africa. Even with an estimated 65% of arable lands, 30% of grazing land and 20% of forests already degraded in Africa, the region still has the potential to position itself as champion in food production. Sustainable soil management is vital to achieving this goal and, for this reason, is one of the cornerstones of the Global Soil Partnership (GSP). The African Soil Partnership has identified six main areas of action as priority in sub-Saharan Africa which include: a)Addressing soil degradation as a major factor in food insecurity and making country and region-wide efforts to rehabilitate degraded lands and change them to productive assets through community participation; b) Guiding and enabling the implementation of sound and sustainable soil management practices and the restoration of soil health at all levels towards food security; c) Developing, updating and disseminating updated and harmonized national and regional soil resource information addressing all user needs including soil fertility information and making the best use of science available to increase soil productivity; d) Addressing climate change and developing resilience towards climate change adaptation; e) Developing and implementing training and capacity building programmes in all soil applications for existing and new generations of experts in soil science and land management, taking into account the gender balance; f) Establishing linkages and networks with other national, regional and global initiatives that impact soil health. This paper discusses all the identified challenges associated with Sustainable Soil Management in Africa and Regional implementation plans for addressing the challenges. The Implementation Plan sets out the road map for the next 5 years to achieve SSM over the longer term and includes a large number of outputs and activities which are considered priority in this first phase of establishing the AFSP. It is envisaged that funding for these activities will be secured by capitalizing on existing in-country initiatives and activities, as well as by actively sourcing additional external funding. Since the GSP is a voluntary initiative, it calls for the strong support of national governments, as well as national and regional entities involved in natural resource management to contribute to achieving the common goal of improved and sustainable soil management.

Keywords: African Soil Partnership, Sustainable Soil Management

Financial support: Africa Regional Office of FAO/UNO in Accra Ghana

(8699 - 2558) Agricultural potential for Crop-Livestock-Forestry integration system in the Matopiba region, Brazil

José Francisco Lumbreras[1]; Amaury de Carvalho Filho[1]; Paulo Emilio Ferreira da Motta[1]; Pedro Luiz de Freitas[1]; Alexandre Hugo Cezar Barros[1]; Mario Luiz Diamante Aglio[1]; Ricardo de Oliveira Dart[1]; Hilton Luis Ferraz da Silveira[1]; Carlos Fernando Quartaroli[2]; Rodrigo Estevam Munhoz Almeida[3]

Embrapa Solos[1]; Embrapa Territorial[2]; Embrapa Pesca e Aquicultura[3]

In this paper, it is presented the agricultural potential for integrated production systems for the Matopiba region, which covers approximately 73 million hectares and represents an important frontier for the expansion of agricultural production in Brazil. In soil and climate studies, the main limitations to agricultural land use have been identified, complemented by field campaigns to validate interpretations. The agricultural potential of the land for the adoption of Crop-Livestock-Forest integration systems (CLFi) considered the high technological level for crops, and medium and high for silviculture and planted pasture. The evaluation is presented in map compatible with the 1:500,000 scale. Mixed systems of agricultural production, based on the spatial and temporal integration of agricultural components (annual and perennial crops), forestry (silviculture) and livestock (pasture) were considered. The systems used for sustainable intensification of land include: crop-livestock-forest system or CLntegrating agricultural, livestock and forestry components in rotation, consortium or succession in the same area. They include the forest-agriculture systems or crop-forest integration with emphasis on crop-forestry systems; crop-livestock systems or Crop-Livestock integration (CLi): integrating agricultural components (annual crops) and livestock in rotation, consortium or succession, in the same area and in the same agricultural year or for multiple years. They include inadequate areas for the implantation of forest species; forest-livestock systems or Livestock-Forest integration (LFi): integrating livestock (pasture and animal) and forestry components into a consortium. They include areas that are unsuitable for planting; and, pastoral systems - exclusively for livestock component in areas not suitable for crops or forestry. They include the recovery of degraded pastures and management techniques that guarantee high productivity and pasture support capacity. A wide range of soils occur under varying climatic conditions, reflecting distinct qualities and vulnerabilities for agricultural land use. Soils with great potential for agriculture, such as Argissolos and Latossolos, are noticed. On the other hand, soils with a high vulnerability to degradation, with high sand content (Neossolos Quartzarênicos), gravel (Plintossolos Pétricos) and strong drainage restrictions (Plintossolos Argilúvicos and Háplicos, Gleissolos and Planossolos) are frequent.

Keywords: soil, agricultural suitability, environmental planning, integrated production systems

Financial support: Work executed with Embrapa resources (SEG / IDEARE Project 05.13.25.009.00.00).

(3555 - 2167) Arbuscular mycorrhizal fungi and phosphate