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“Competition for Resources in a Changing World:
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Improved Legume-Cereals Based Cropping Systems for Improved Productivity and Natural Resource Management by Resource Poor Crop-Livestock Farmers in West Africa

HAKHEEM A. AJEIGBE¹, ALPHA YAYA KAMARA², DAVID CHIKOYE¹

¹*International Institute of Tropical Agriculture (IITA), Kano Station, Nigeria*

²*International Institute of Tropical Agriculture (IITA), Crop Improvement, Nigeria*

Abstract

Most farmers in West African savannahs grow local varieties of grain crops in various intercropping systems with little or no purchased inputs. In these systems, legumes yields are low due to shading by cereals and lack of plant protection measures while cereal yields are low due to lack of fertiliser. On-Station trials have shown that overall farm yield could be increased in a sustainable manner through adoption of improved varieties of crops, improved cropping systems, and crop-livestock integration. A large scale farmer participatory on-farm evaluation and dissemination of the system involving about 5000 farmers, covering different agro-ecological zones in the savannahs of West Africa was conducted from 2002 to 2007 to demonstrate the superiority of the improved systems on-farm and its importance in natural resource management. The system involved growing improved cowpea varieties with cereal in a 2 cereal: 4 cowpea row to row arrangements, with selective application of inorganic and organic fertilisers to the crops and 2 to 3 insecticide sprays to cowpea. Crop residues from the fields were taken to the homestead and fed to confined small ruminants during the dry season. The manure gathered from these animals was then taken to the field for soil fertility improvements. The result indicated that the improved cropping systems, using improved varieties of cowpeas, were superior to the traditional system with over 300% increase in value of the crop produce depending on locations. Feeding the residues of cereals alone resulted in weight loss while feeding the residues of cowpea or groundnut alone resulted in the weight gain of about 13% and 12% respectively. Supplementing the cereals residues with about 300 g of cowpea or groundnut residues per ram per day resulted in slight gain in weight and thus the body weight was maintained. Farmers were able to generate an average of 550 kg manure (dry weight) in 60 days of confine feeding of average of 6 ruminants (sheep and goat).

Keywords: Cereals, cowpea, cropping systems, intercropping, strip-cropping