Australian Government
Australian Centre for International Agricultural Research

North-West Vietnam Research Symposium 2017

SUSTAINABLE LAND MANAGEMENT PRACTICES IN SYSTEMS BASED ON CASSAVA AND MAIZE IN THE NORTHWEST OF VIETNAM

Do Trong Hieu, Le Viet Dung, Phan Huy Chuong, Nguyen Tien Sinh, Nguyen Van Chung, Nguyen Thanh Hai

Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI)

INTRODUCTION

Maize and cassava are the two most common and important crops in the North-ern mountainous region of Vietnam. This region has largest area of maize and sec-ond largest area of cassava in the Country but also the lowest yield of these two crops. The market drives the large scale of production, and the low yield is related to the practices of monoculture and slash and burn, which causes high levels of soil erosion. To improve this situation, NOMAFSI has over past years worked in partnerships with provincial DARDs and with ACIAR, CIRAD, CIAT and ICRAF to de-sign sustainable land management (SLM) practices and to promote their adoption by smallhold-er farmers in the Northwest.

Intercropping rice bean with maize on sloping land

Using crop residue of previous crop season to cover the land surface in maize field

RESEARCH APPROACH

Participatory research was the main approach we used. Suit-able farmers were selected to conduct trials in their fields at various sites (Table 1),with guidance and support from re-searchers and extension officers. Research farmers partici-pated in all the activities, including planning, establishment and evaluation of the trials, crop management, harvest and economic benefit calculation. In addition, field days, work-shops and cross visits were organized for local farmers, and for extension and government officers, together with re-searchers, to discuss the impacts of practices as well as the difficulties facing farmers in adopting these practices.

We also supported the scaling-out of SLM practices through organizing FFSs and developing farmer networks where, in linkage with local government initiatives, larger numbers of farmers were facilitated to adopt practice(s) suited to their con-crete conditions.

Intercropping black bean in cassava field in Van Yen, Yen Bai 2010

Intercropping peanut in cassava field in Mai Son, Son La (2017)

Planting Guinea grass hedgerow to prevent soil erosion in Yên Bình, Yen Bai (2014)

A field day for farmers and local officers to discuss the im-pacts of SLM practices on cassava growth and yield

RESULTS AND DISCUSSION

Four SLM practices have been designed/improved, evaluated and promoted for adoption, including minimum tillage, in-tercropping with legumes, planting grass hedgerows and mi-ni-terracing.

Results showed that all these practices could help reduce the level of soil erosion by 50 – 90% and improve soil quality. This eventually lead to an increase of 15% –50% in the yield of maize and cassava.

However, there were also difficulties in adopting these prac-tices, mainly increased inputs, increased problems of pest control and shortage of mulch materials. Through linking with local government initiatives we could help farmers over-come these difficulties and facilitate adoption. Reduced till-age is now applied by almost all households in Van Chan dis-trict (Yen Bai province) and Chieng Hac commune (Mai Son district, Son La province) for their maize fields, and grass hedgerows and intercropping with legumes are applied for nearly 7,000 ha of cassava in Yen Binh and Van Yen districts (Yen Bai province), and for some areas of maize on slopes in Mai Son district (Son La province).

Intercroping black bean on mini-terraces' surface inmaize field on sloping land

Harvesting intercropped peanut in maize field on sloping land

Effects of practices on the control of soil erosion

Experimental site	Crops	Amount of soil washed off away (tones/ha/year)					Decrease in comparison to the control by (%)
		Control	With mulch	Intercropping	Mini -terraces	Green hedge-row	
Na Ri, Bac Kan 2004	Maize	16.4	-	-	1.0 (mini -terraces combined with mulch	-	93.9%
Van Chan, Yen Bai 2008	Maize	106.0	-	-	12.0 (with mulch)	-	88,7%
Mai Son, Son La 2010	Maize	41.6	-	20.4 (peanut)	-	-	50.9%
Muong Khuong, Lao Cai 2010	Maize	47.9	14.4	-	-	-	69.9%
Son La, 2009	Cassava	17.6	-	2.3	-	4.9	72.2 – 86.9%
Yen Binh, Yen Bai 2014	Cassava	18.63	-	10.5 (black bean combined with grass hedgerow)	-	12.13	34.9 - 43.4%

CONCLUSION

The application of reduced tillage, intercropping with leg-umes, planting grass hedgerows and miniterracing have long-term potentially positive impacts to pro-tect sloping land and improve crop growth and yield. However, support is neces-sary to local farmers to overcome problems in adopt-ing these practices. With par-ticipatory working approach, and in particular, in linking with local government ini-tiatives for sustainable agriculture development we have significant-ly succeeded in promoting the adoption of reduced tillage, intercropping with legumes and plant-ing grass hedgerow. In many Northwest farming communities these three practices are now largely applied for both cassava and maize. Because of very high cost of la-bour for making and maintaining mini-terraces no farmers selected miniterracing for their maize and cassava fields.

More research effort is nevertheless required to study the im-pacts of practices when they are adopted at a larger scale in order to develop the scientific basis for devel-oping suitable policies and mechanisms supporting further adoption in the whole region .