Improving the Production and On-farm Utilization of Cassava by Farmers in Laos and Cambodia

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Introduction

Cassava is traditionally grown as a subsistence crop and is one of the main sources of energy for many people, especially those living in remote rural upland areas. Cassava roots are a low-cost energy source for livestock feed and can also be used to produce starch. Leaves of cassava are high in protein (typically 18-28% crude protein) and can be eaten by people or fed to their livestock. However, cassava roots and leaves contain hydrogen cyanide (HCN) and need to be processed before eating or feeding to animals.

The crop has a high yield potential and can be grown in a wide range of upland conditions. Farmers can grow cassava as a cash crop that can be produced on marginal soils with little inputs. However, cassava yields are low in traditional systems in both Laos and Cambodia because of the lack of high-yielding varieties and the use of inappropriate agronomic techniques.

The Nippon Foundation-funded Cassava Project in Asia has introduced and evaluated in Laos and Cambodia many improved cassava varieties, and has tested their on-farm utilization as well as better farm management practices under a wide range of socio-economic and biophysical conditions.

Objectives

- To evaluate, together with farmers, improved cassava varieties, crop management and on-farm utilization of cassava roots and leaves that will increase cassava yields and farmers' income while conserving the natural resources such as soil and water.

- To disseminate selected cassava varieties with high yield and dry matter contents, to improve the sustainability of cassava production systems and to increase the livelihoods of smallholder farmers.

Methodology

High yielding varieties of cassava were introduced, mainly from Thailand, and were evaluated on-station and in farmers' fields to show the effect of alternative varieties on yields and income in different agro-ecological zones, particularly in areas at high elevation and with a cold winter season. Farmer participatory approaches were used to ensure that farmers were fully involved in the decision making process.

Results

Promising improved cassava varieties

In Laos and Cambodia, the introduced varieties (eg. Kasetsart 50 and Rayong 72) produced the highest fresh root yields and had the highest starch contents; these were significantly higher than those of the local variety. In on-farm trials, root yields varied from 7-67 t/ha. In most of the trials, yields were significantly higher in the fertilized than in the unfertilized plots. The crop responded particularly well to P and K fertilizer in Xieng Khouang in Laos and to K fertilizer in Kampong Speu province of Cambodia.

Results of an on-farm variety trial in Xieng Khouang province, Laos (harvested in March 2007, 2-year cassava)

Variety	Fresh root yield (t/ha)	Starch content (%)	Starch yield (t/ha)
Rayong 72	40.0	28.1	11.2
Rayong 90	39.6	27.2	10.7
KU 50	26.4	29.5	7.8
Local	4.0	18.0	0.7

Intercropping with cassava for smallholder farming systems

Intercropping cassava with grain legumes is considered to have many advantages for smallholder farming systems, as a way to reduce risk of crop failure, to provide diversity of crops, to have positive effects on soil fertility and soil erosion, and to obtain production at different times of the year.

Cassava leaf silage and leaf meal: a very good feed supplement for livestock

On smallholder farms livestock feeds are almost always deficient in protein. Cassava leaves are an excellent source of protein. Drying or ensiling of cassava roots and leaves are good preserving methods and reduce the HCN content in the feed to acceptable levels. Pigs can be fed approximately 10-30% of cassava leaf silage or leaf meal in the feed ration.

Feeding cassava leaf silage can make your pigs grow faster…

Cassava leaves can be either sun dried in the dry season or made into leaf silage during the wet season. These can be kept and used as high quality protein sources in the dry season when there are few other protein sources available. Under village conditions using cassava leaf meal or silage for growing pigs can improve the live weight gain and reduce feed cost.

Conclusions

Improved cassava varieties and production technologies introduced by CIAT into Laos and Cambodia, such as KU 50 and Rayong 72, can significantly increase both the fresh root yield and starch content.

At the farm level, cassava roots and leaves can easily be made into dry root or leaf meal, or into root or leaf silage, and then fed to livestock.

Farmer participatory research and extension approaches are a good way to test and disseminate high-yielding cassava varieties and improved methods of on-farm utilization, to increase the sustainability of cassava production systems, and to improve the living standards of farmers through increased income in Laos and Cambodia.