# Dissemination of No-Till systems in Southern Xayabury, Lao PDR

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## Context and objective

Since 2003, the Lao National Agro-Ecology Programme (PRONAE) has implemented a holistic research approach which emphasises generation and adaptation of direct seeding mulch-based cropping (DMC) systems with groups of smallholders. Based on this experience, the Development Project of Southern Xayabury (PASS-PCADR) has promoted maize production using DMC on former crop residues. The aim of this paper is to highlight the dissemination process with village communities and the potential for widespread adoption in southern Xayabury.

## A Holistic Approach to Disseminate Soil Conservation Technologies with Smallholders

This approach, based on local farming systems and environmental conditions, comprises five components:

- Initial assessment to integrate all aspects of smallholders' strategies and environmental conditions.
- Permanent training of stakeholders (smallholders and extension agents).
- Organization of farmers groups and technical supports for the dissemination of DMC systems.
- Information on market access (specific inputs) and organization of annual credit with traders.
- Follow-up and analysis of extension and adoption by farmers.

Figure 1: Landscape unit in southern Xayabury

Figure 2: Direct seeding with the use of hand-tractor

## Materials and method

Twelve DAFEO agents were involved in the dissemination of DMC systems within twenty farmers groups (437 families) during the season 2006. Specific equipment for sowing (hand jab seeder, hand tractor and medium size tractor) and spraying have been bought in southern Brazil (pioneer in DMC systems). These equipments were made available to smallholders. The performances of cropping systems, for both conventional and DMC (labour inputs, yield and production costs) and equipment were recorded along with constraints identified by smallholders.

Figure 3: Maize direct seeding on Coïx lacrima residues

## Results

*Dissemination of DMC systems*

Within twenty farmers groups 465 ha were sown under DMC systems with residues management and more than 100 ha were seeded with specific sowing machine. Mean area under DMC systems per family ranged from 1 to 2 ha where mechanization was made available. Moreover, private sector supported more than 65% of the total credit used during the cropping season for these 437 households. Therefore, constraints identified previously by PRONAE (labour drudgery and economic incentives to start such systems) were overcome during this season.

*Agro economic results*

Results of two districts (Paklay and Thongmixay), which are characterized by contrasted morphopedological units and farming systems, are presented in Table 1. Paklay is mainly characterized by intensive maize monocropping system based on ploughing and use of herbicide; on the other side cropping systems in Thongmixay are more diversified (Job's tears, maize, peanut, upland rice) with rotational sequence with fallow period from 2 to 3 years. Yields are similar between conventional ploughing and residues management. However, net income are significantly higher under DMC systems with a relative increase of 95% and 62%, respectively, for Paklay and Thongmixay. Labour productivity increased greatly between these systems and reached in southern Paklay 8.8 $US per day (figure 3).

## Prospective and Conclusion

This first group of twenty villages will be extended to forty villages for a total 650 households. Exchanges have been organized with the private sector and farmers groups to define the process of transferring all these systems and technologies. For the coming season, equipment will be rented by farmers and service providers. This transfer will allow widespread and fast dissemination of DMC systems and at the same time preservation of soil production potentialities and natural resources.

| | Paklay (52) | | Thongmixay (20) | |
|---|---|---|---|---|
| | CV | DMC | CV | DMC |
| Yileds (kg/ha) | 3465 | 3297 | 2307 | 2806 |
| Production cost (US$/ha) | 208 | 84 | 56 | 73 |
| Gross income (US$/ha) | 328 | 312 | 178 | 270 |
| Net income (US$/ha) | 120 | 228 | 122 | 198 |
| Labour productivity (US$/day) | 4,0 | 8,8 | 3,2 | 5,8 |

Table 1: Comparison of agro-economic results for conventional and DMC systems, ( ) number of families follow-up

Despite rapid adoption of DMC systems (based on residue management), no-tillage systems have to be progressively improved with rational crop rotations, relay crops and cover crops in order to permanently protect the soil, increase the diversification, reduce utilisation of herbicides and inputs costs.

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