

Comparison of conventional and direct seeding techniques on lowland ecosystem

South of Sayaboury province – PDR Lao

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Lower terraces of lowland ecosystem on the south of Sayaboury

Context

Local glutinous rice cultivars for the rainfed lowland ecosystem have been recently replaced by improved cultivars from Thailand (RD6, RD 10) and Laos (NRRP, NAFRI-ARC/IRRI¹, cv. TDK 1, TDK 3). These varieties are photoperiodic non sensitive with medium crop duration (150 days) and higher yields. However, because of the lack or erratic rainfall in June and July, large uppers terraces areas can not be used as usual, the lack of water not allowing rice transplanting.

Objective

The present study, conducted during the rainy season 2002, analyses agro-economic components of conventional transplanting and direct seeded rice on lowland ecosystem (lower and upper terrace). Direct seeded rice varieties, on weeds and rice residues, have been tested on uppers terraces where no conventional rice system could be performed.

Methods

The experiments involved genetically contrasting cultivars : BSL 2000 and 8 FA 281-2, indica*japonica crosses, growing in irrigated, lowland and upland ecosystems, selected by the CIRAD² ; TDK 1 and TSN 1 grown in irrigated and lowland ecosystems selected at the ARC and a traditional cultivar, photoperiod sensitive, Khao Deng from Kenthao district adapted to lowland ecosystem. In the lower terraces, TDK 1, TSN 1 and Khao Deng were transplanted on 26 of June, after 30 days in nursery, in a randomised block design with four replicates of 50 m² large. BSL 2000 and 8FA 281-2 were sown later (31th of July) on uppers terraces after pre-sowing herbicide application (3l.ha⁻¹ of glyphosate + 1.5l.ha⁻¹ of 2.4-D) on four randomised plots of 96 m² each. After sowing 100 kg.ha⁻¹ of urea was widespread on each plot.

Agro-economic results on conventional and direct seeded rice on lowland ecosystem

Operations	U.C. (USD)	Qty (kg or l.ha ⁻¹)	Direct seeding on upper terrace		Conventional transplanting on lower terrace		
			BSL 2000	8 FA 281-2	TSN 1	TDK 1	Khao deng
1. Inputs							
1.1. Paddy field preparation nursery, lower terrace herbicide	75	1	21	21	75	75	75
1.2. Seeds	0.20	80	16	16	16	16	16
1.3. Fertiliser 46-00-00	0.23	100	23	23			
Total inputs (USD)			60	60	91	91	91
2. Labor (day.ha⁻¹)							
herbicide application		4	4	4			
nursery establishment		8			8	8	8
sowing		30	30	30			
withdrawing and transplanting		54			54	54	54
weeding and slashing			30	30	16	16	16
harvesting			14	21	22	18	23
treshing			16	22	25	23	21
Total Labor (day.ha⁻¹)			94	107	125	119	122
3. Yield (kg/ha)			2420	3460	4630	4760	3860
4. Gross income (USD)			199	310	404	418	322
5. Income per day (USD)			2.1	2.9	3.2	3.5	2.6

Inputs and labor of direct seeding techniques are reduced and improvements could be performed. It will be suitable to introduce, before rice harvesting, some cover crops (legumes or cereal) to feed animals and to reduce weeds pressure. Use of hand seeder will reduce consequently sowing labor.

On uppers terraces where no rice system can be performed this season, BSL 2000 and 8 FA 281-2 showed good yields and incomes per day. Previous data and evaluation indicated that these cultivars can exhibit considerable phenotypic plasticity in different environments.

¹ NRRP : National Rice Research Program , NAFRI-ARC / IRRI : National Agriculture and Forestry Research Center - Agriculture Research Center / International Rice Research Institute ;

² CIRAD : Centre de Coopération Internationale en Recherche Agronomique pour le Développement - Séguy L. and Bouzinac S



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Adaptation of direct seeding techniques for the lowland.