



Practice rice straw management in Lao PDR

Tuesday, 25 Oct 2022



UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific

CSAM

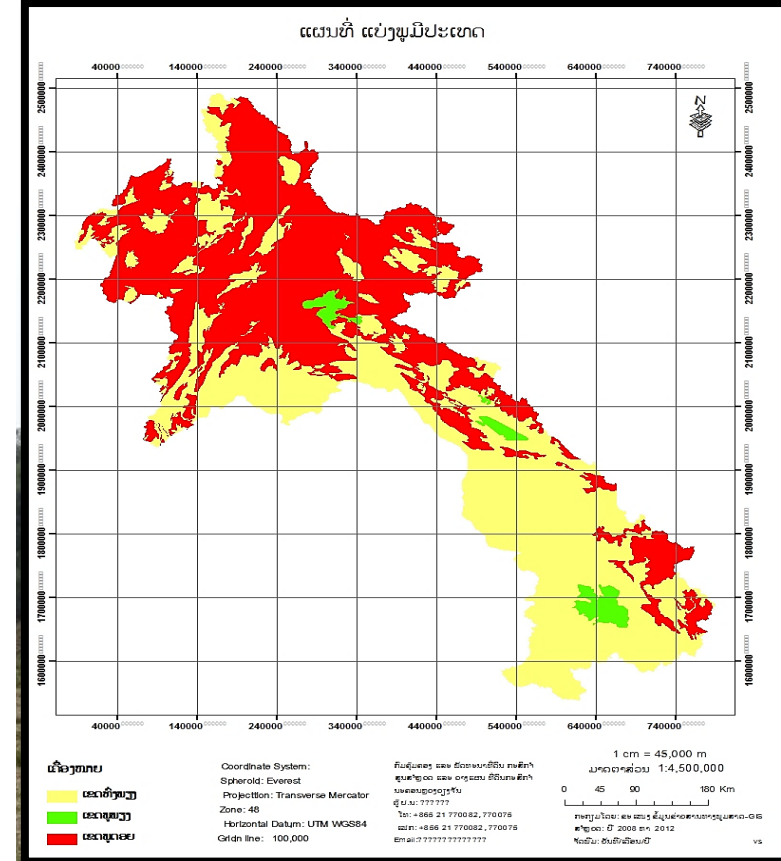
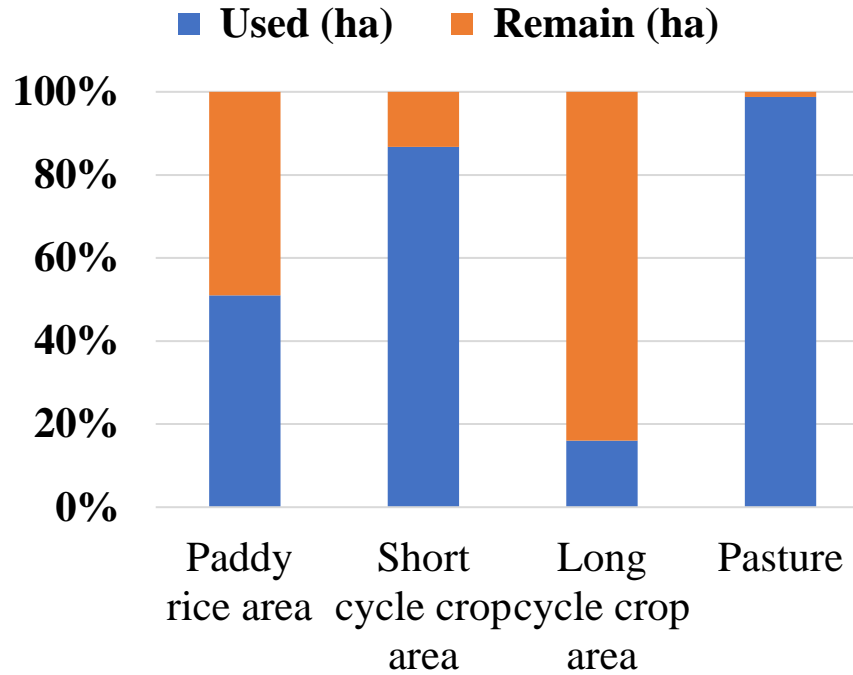
Outline

- **Lao PDR Landscape**
- **Rice straw and crop residue production in Lao PDR**
- **Rice straw and other crop residue practice management**
- **Next forward for straw management**

Lao PDR Landscape

Lao PDR area

- Plain area 46%
- Plateau 1 %
- Steep slope area 53%



No:	Agricultural Land	Used (ha)	Remain (ha)	TT
1	Paddy rice area	1,019,548	980,452	2,000,000
2	Short cycle crop area	867,763	132,237	1,000,000
3	Long cycle crop area	128,073	671,927	800,000
4	Pasture	691,527	8,473	700,000
	TT	2,706,912	1,793,089	4,500,000
	%	60%	40%	100%

Rice straws and crop residue production the Lao PDR



Table.....: Rice cultivation area, crop and its straw in Laos
(Source: Laos year book 2020&2021)

Crop	Area (ha)	Crop production (ton/year)	Tot Straw (ton/year)	used straw (%)
Rice	904,372	3,567,121	1,961,916	**
Maize	133,697	726,766	**	**
Legume	7,532	17,480	**	**
Root crop	25,028	759,394	**	**
Upland crop	17,653	65,912.11	**	**
Fruit tree	11,670	208,379	**	**
Vegetable	57,518	483,926	**	**

Rice straw and crop residues use in agriculture

Rice straw used for:

- Cover soil surface on field
- Rice straw incorporation in to the soil



Cover soil surface



Cattle feeding



Crop residue management:

- Cover on the soil surface in the field,
- Animal feeding



Incorporate to the soil



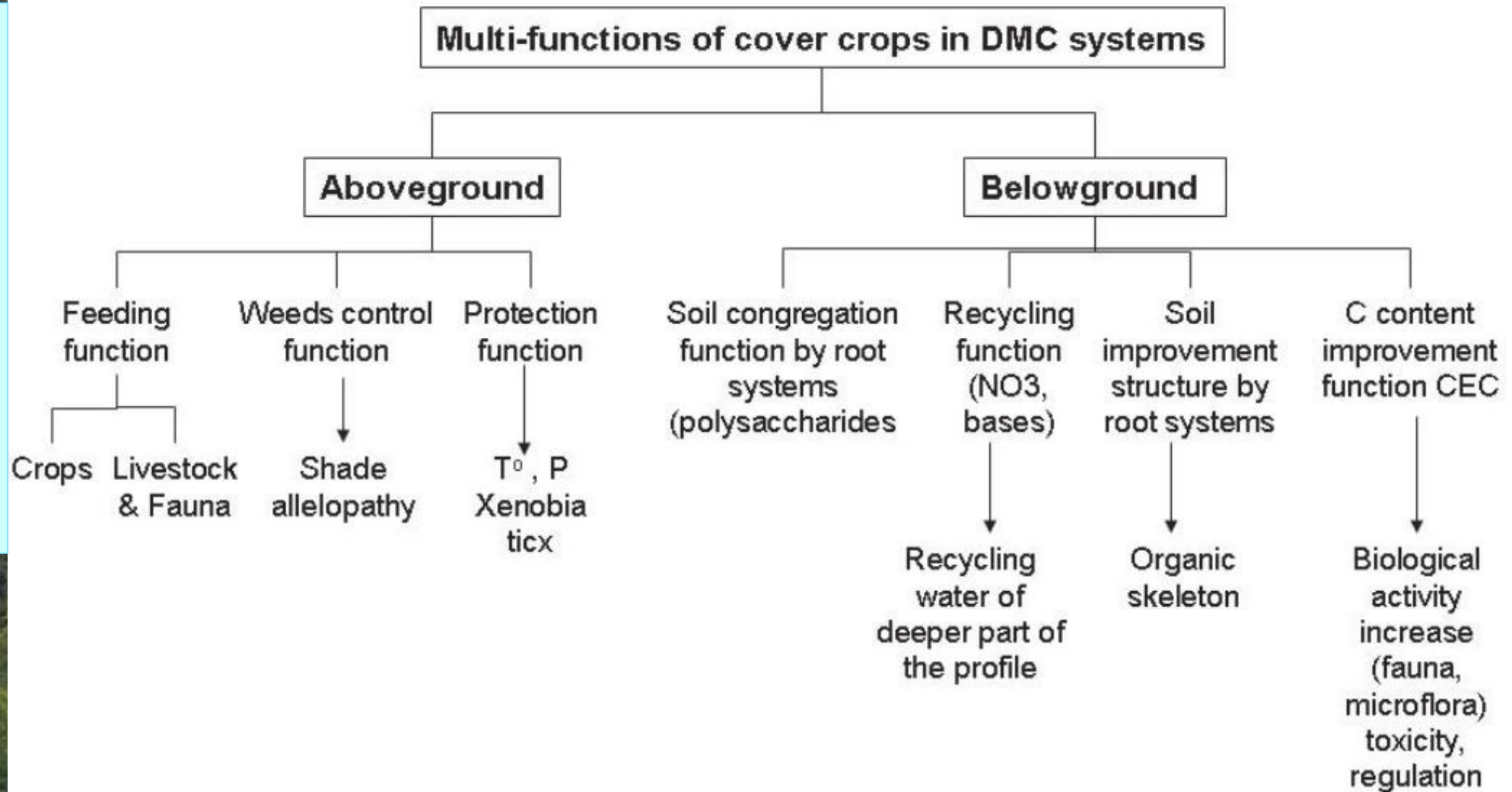
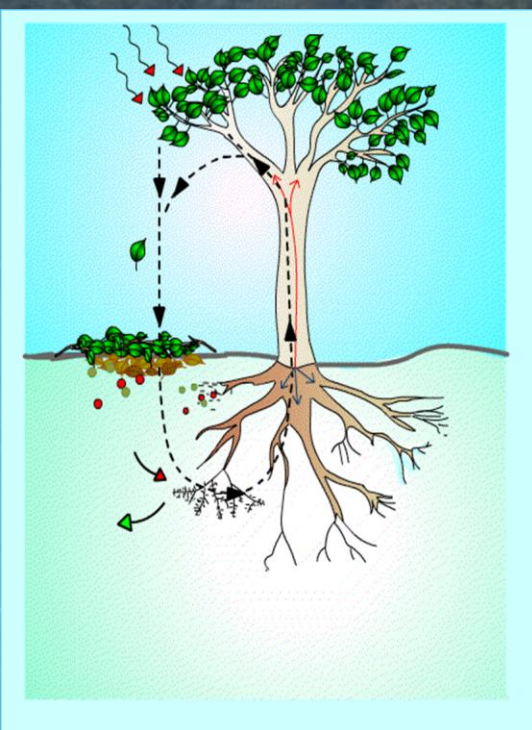
Compost

Direct seeding Mulch-base cropping systems (DMC)

Principles of DMC:

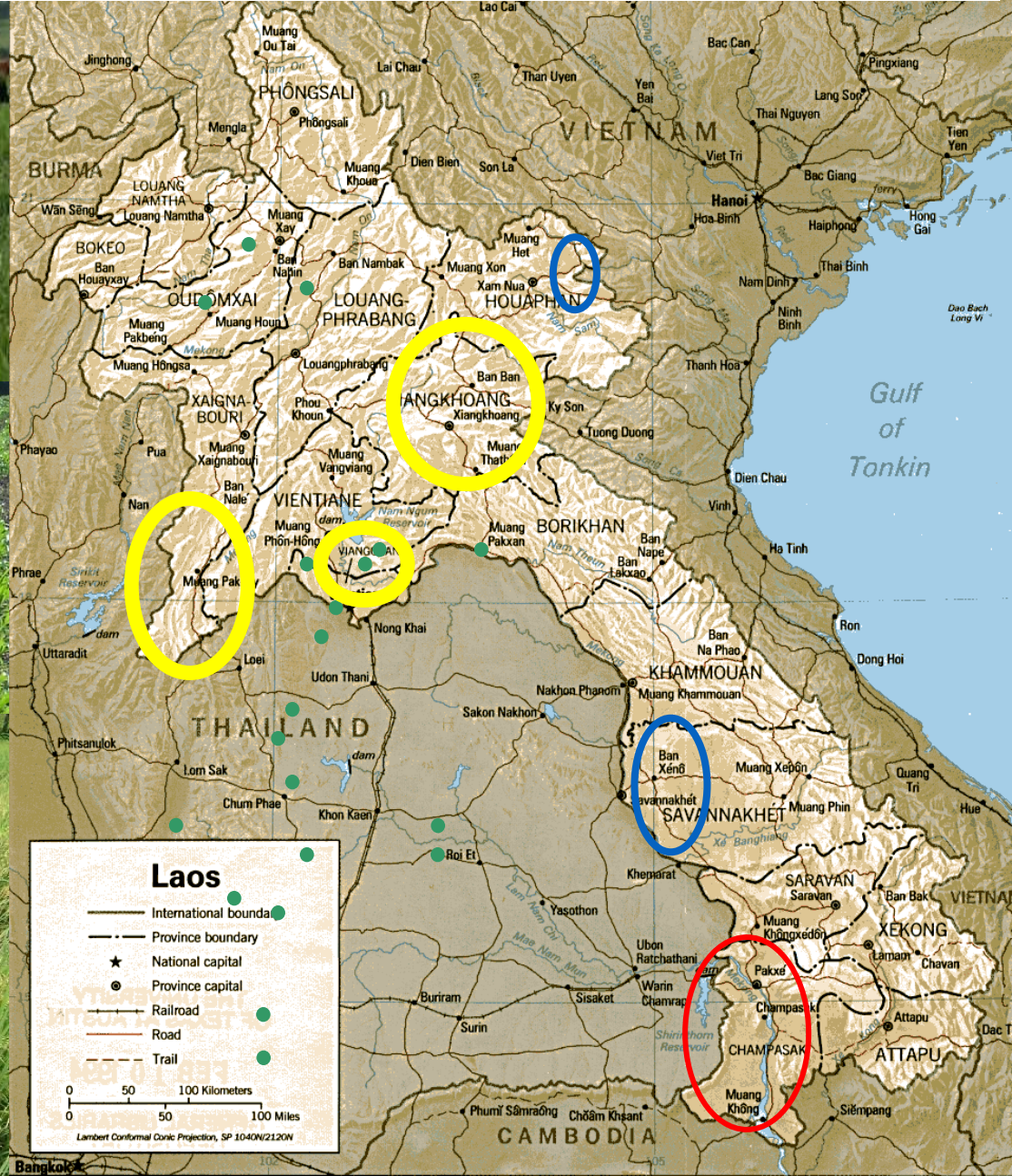
- ✓ **Soil no longer disturbed, or as little as possible, by mechanical action and is always kept covered by crop residues and the cover crop. (Boyer et al. 2001; Scopel and Findeling 2001).**
 - **Soil erosion decrease, mulch control soil erosion, decrease temperature fluctuation, enhance macro-micro-fauna activity.**
- ✓ **Spatial and temporal diversified schemes (rotation, association, annual crop sequence)**
 - **Provide increase farming income by reduction cost production and climatic risks (Sguy et al. 1998; Richter et al., 2002)**
- ✓ **Maintain Soil-plant stability and resilience, cover crops are used to produce grain and dry matter,**
- ✓ **Cover crops enhance the efficiency of the whole system fulfilling many agronomic and ecological functions emphasise the multi-functionality of cover crops, which are nutrient pumps.**

Direct seeding Mulch-base cropping systems



Source: Scopel et al., 2003.

DMC in Lao PDR 2003 – 2010



Crop residue management in DMC in Lao PDR

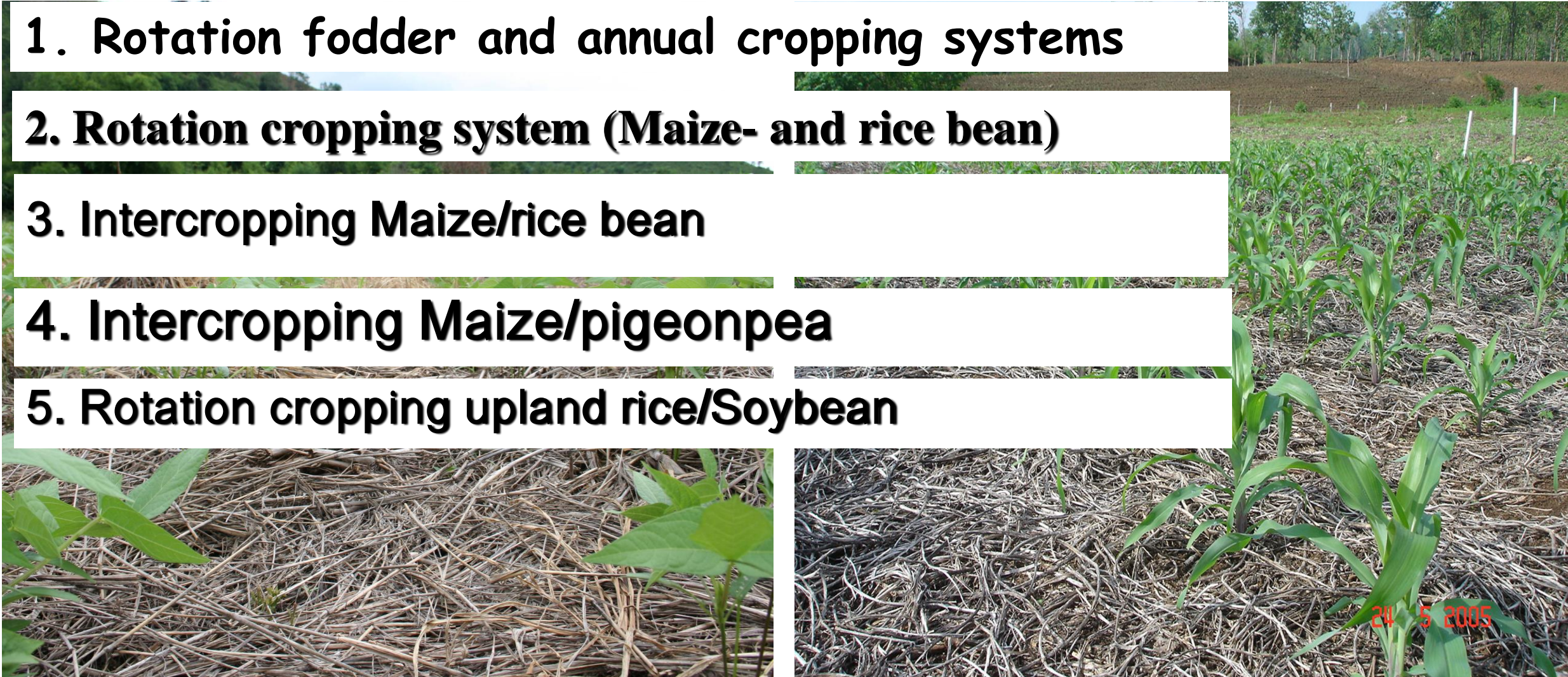
1. Rotation fodder and annual cropping systems

2. Rotation cropping system (Maize- and rice bean)

3. Intercropping Maize/rice bean

4. Intercropping Maize/pigeonpea

5. Rotation cropping upland rice/Soybean



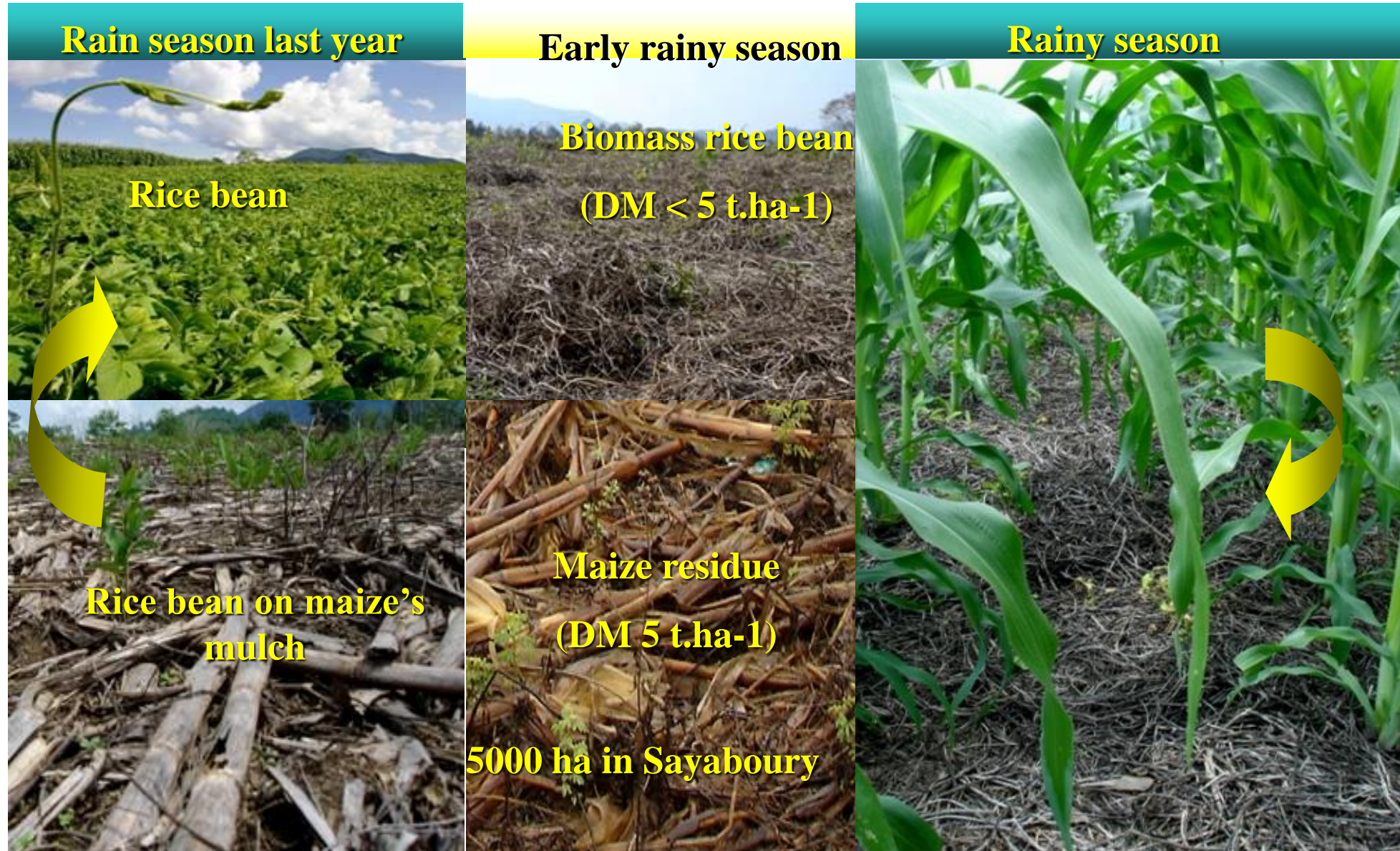
Rotation fodder and annual cropping systems



4 4 5 6 7 8 9 10 11 11 12 1 2 3 4 4 5



Rotation cropping system (Maize- and rice bean)



Intercropping Maize/rice bean



Intercropping Maize/pigeonpea



Rotation cropping upland rice/Soybean

Rainy season last year



Dry season



Rainy season



Upland rice on soybean biomass

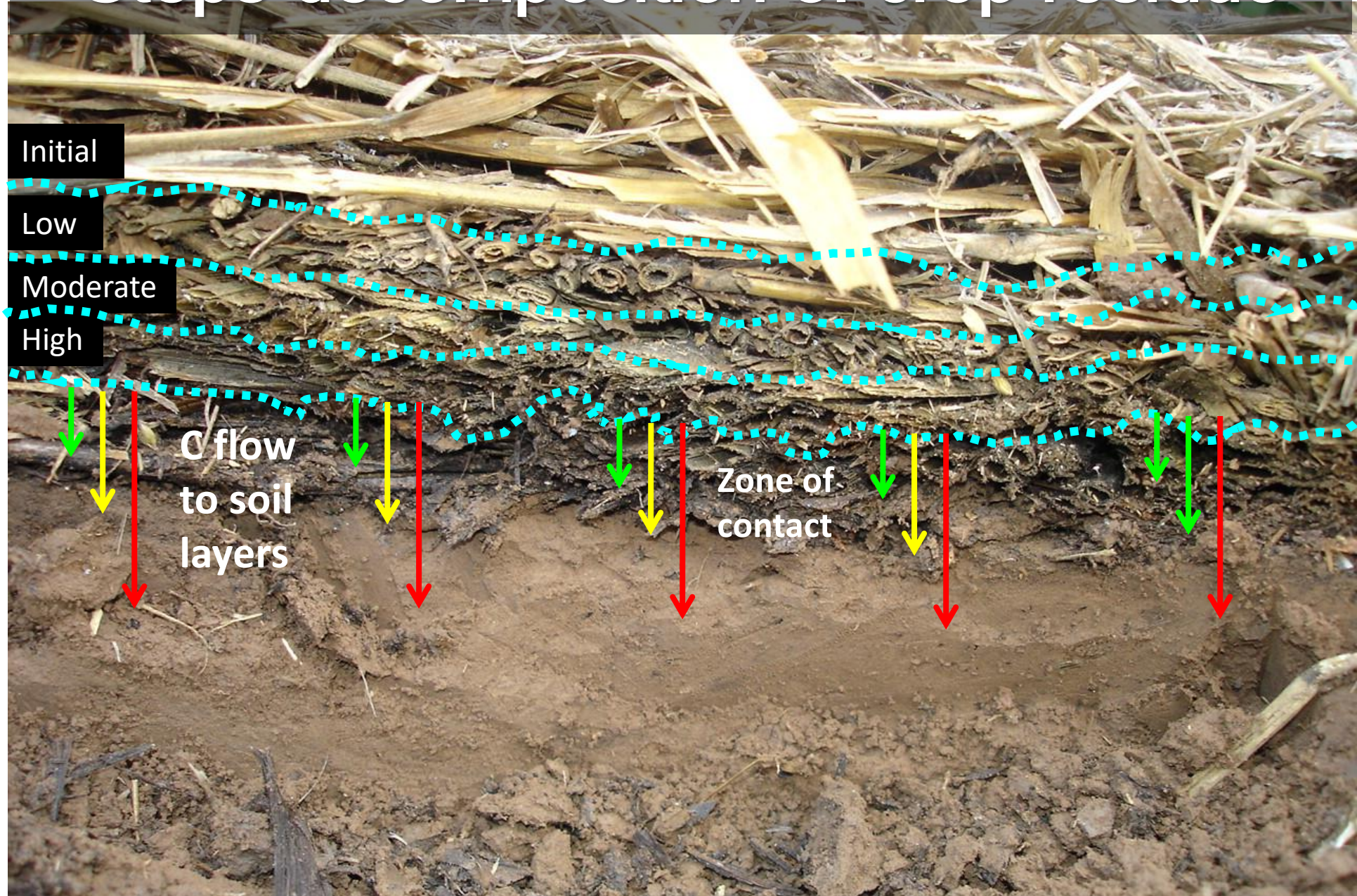
A photograph showing a field of young upland rice plants growing in rows. The ground is covered with a layer of dry rice straw mulch. The background shows a line of trees and distant hills under a cloudy sky.

Biomass of soybean
(DM 3 t.ha⁻¹)

A photograph showing a field of mature soybean plants with green leaves and developing pods. The background shows a landscape with hills and a cloudy sky.



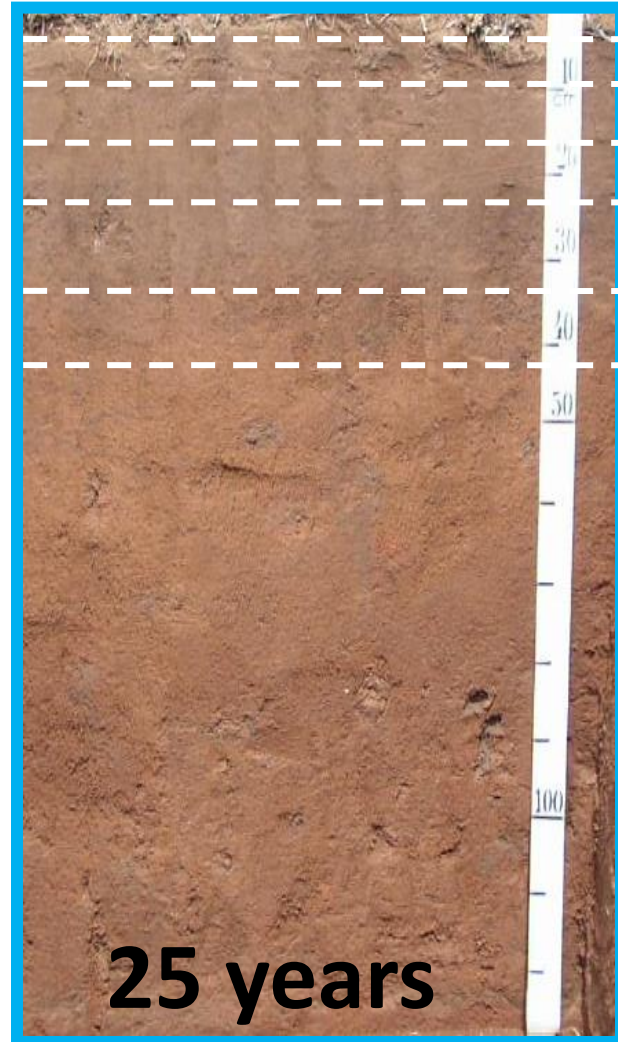
Steps decomposition of crop residue



Comparison of conventional tillage # No tillage on soil preparation

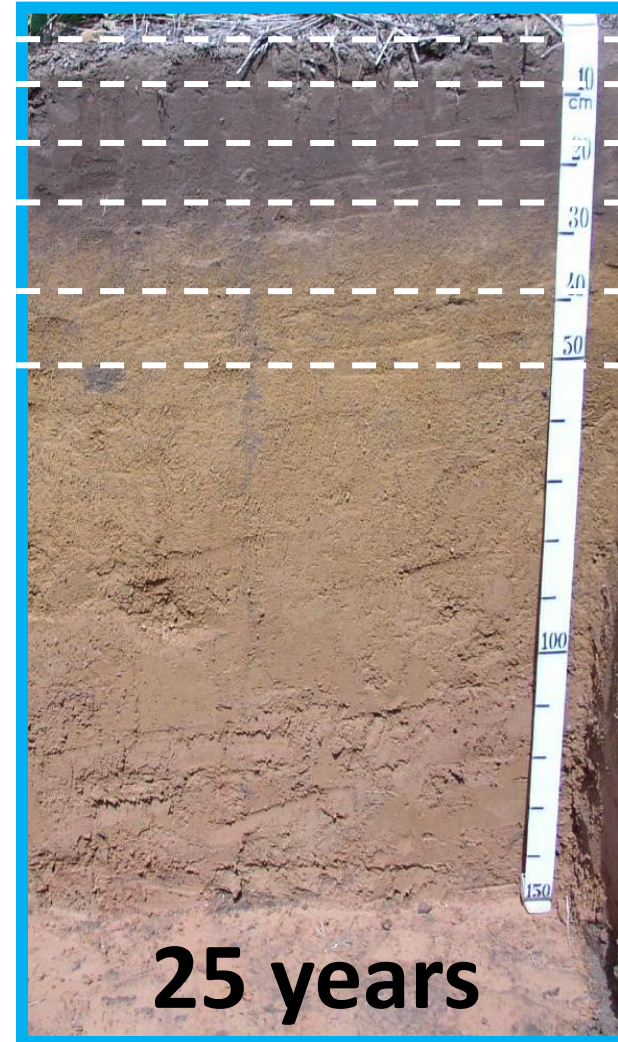
CT

27 g kg⁻¹
25 g kg⁻¹
23 g kg⁻¹
19 g kg⁻¹
12 g kg⁻¹
8 g kg⁻¹



NT

55 g kg⁻¹
43 g kg⁻¹
32 g kg⁻¹
19 g kg⁻¹
11 g kg⁻¹
8 g kg⁻¹



Source: Sá and Lal, 2009

Next forward for straw management

- Database setting crop residue management ,
- Research on impact of difference technology residue management.
- Scaling up good management of residue and straw to farmers,
- Capacity building staff and farmer producers,

Thank you for attention