ĐẠI HỌC AN GIANG

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MEKARN

Conserving fresh rice straw as animal feed; a strategy to avoid the pollution caused by burning in Mekong delta, Vietnam

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Introduction

Mekong Delta	2008	2007	2006	2005
Planted area of paddy (ha)	3,683,880	3,683,100	3,773,860	3,826,220
Yield of paddy (tones/ha)	5.61	5.07	4.83	5.04
Production of paddy (tones)	20,682,200	18,678,900	18,251,400	19,298,500
Production of rice straw (tones)	16,545,760	14,943,120	14,601,120	15,438,800

(An Giang Statistical yearbook 2008)

Introduction

- Total of cattle in Mekong delta in year 2008 was 756,639 heads.
- Rice straw as feed for cattle was estimated 828,519 tonnes (about 5% total production rice straw)
- Using rice straw for planning mushroom was only small part of straw (0.004%)
- Remainder of rice straw was underutilized

Introduction

- In Mekong Delta, there are 2 season: Dry and Rainy season and flood annually

- Winter-Spring , 100% farmers applied burning straw,
- Summer-Autumn was 91.6%
- Autumn-Winter was 63.4%
- Average 87% rice straw was burned

Factors in air pollution

- **There was 87% rice straw burned in all year long.**

Burning one tonne rice straw released 0.93 tonnes CO_2 yearly!

(Ngo Thi Thanh Truc and Duong Van Ni, 2004)

waste rice straw in the field when flooding come

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Factors affecting water pollution

- **Rice straw buried under water can result in production of methane, H_2S, C_2H_4 and organic acids (Vu Tien Khang 2005, Nguyen Thanh Hoi 2008)**
- **To reduce this problem to a minimum, we can increase feeding of rice straw for cattle.**

How to solve this problem?

- Area for planning grass is limited
- But rice straw use as feed for ruminants is limited by the high levels of lignin and silica in the straw. So shortages of roughage for cattle are problem serious.
- By processing the rice straw, its quality and digestibility can be improved. Increasing the protein content of rice straw.

How to solve this problem?

- To process rice straw
  - Ensiling with urea (Nguyen Xuan)
  - Treating with urea (dry straw)
  - Treating with urea plus lime (fresh rice straw stored for 4 months)

Materials and methods

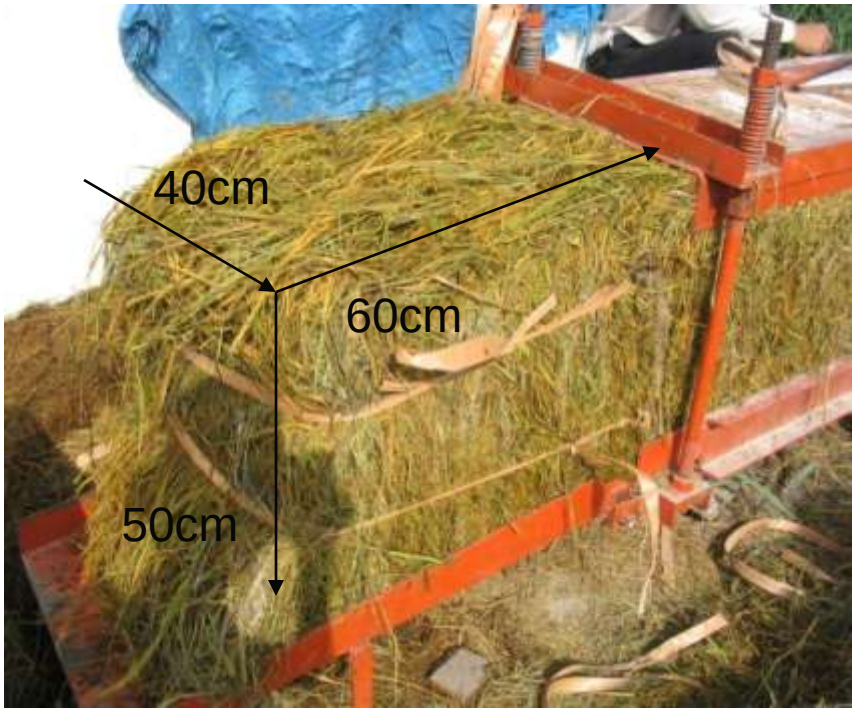
- The rice straw was collected immediately after threshing and packed in bales by machine (rectangular blocks of 40*50*60cm in width, height and length, weighed from 35 to 50 kg).

- The straw bales after packing (were piled in a heap, first scattering urea and lime on each layer (2% urea and 4 % lime in DM basis of the straw) before adding the next layer.

- After applying the urea the heap was covered by a plastic sheet and stored for 4 weeks or longer according to usage

Fresh (green) rice straw packed by machine

Fresh rice straw packed by machine



Straw bales in the first layer

Fresh rice straw heap

Covering the rice straw heap

Fresh rice straw heap covered

Results


VANUATU
Port-Vila
FIJI
TONGA
Chesterfield
New Caledonia
Northern Territory
Queensland
AUSTRALIA
Brisbane
OCEANIA
NEW ZEALAND

Rice straw after urea–lime treatment

After 3 weeks

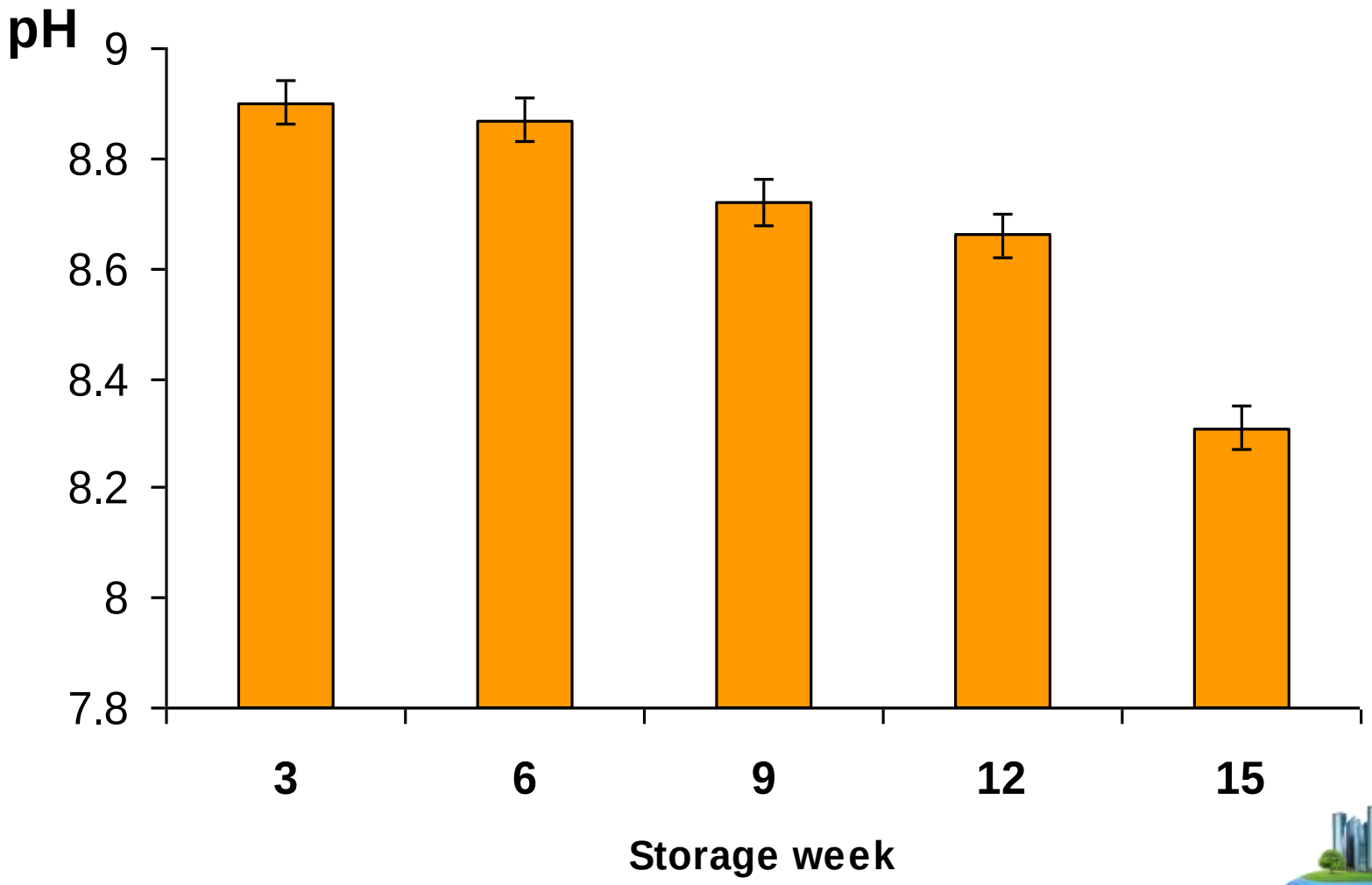
After 6 weeks

Rice straw after urea–lime treatment

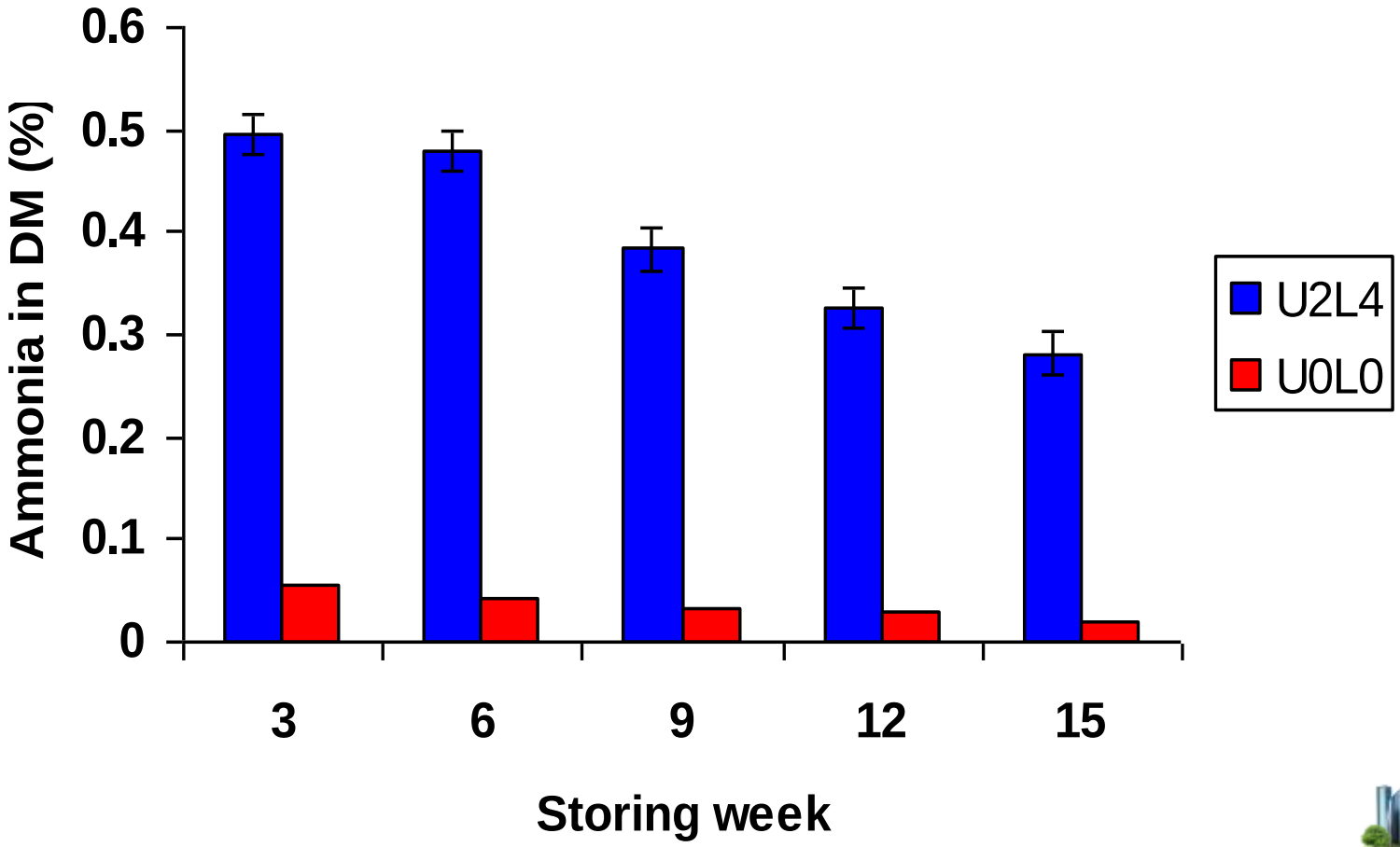
After 9 weeks

After 12 weeks

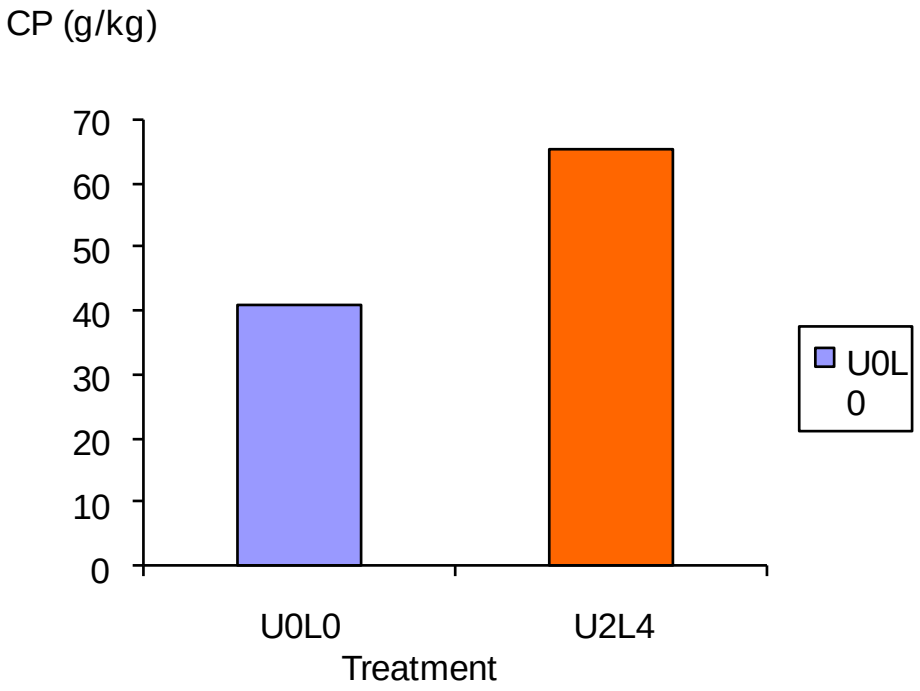
pH values after storing



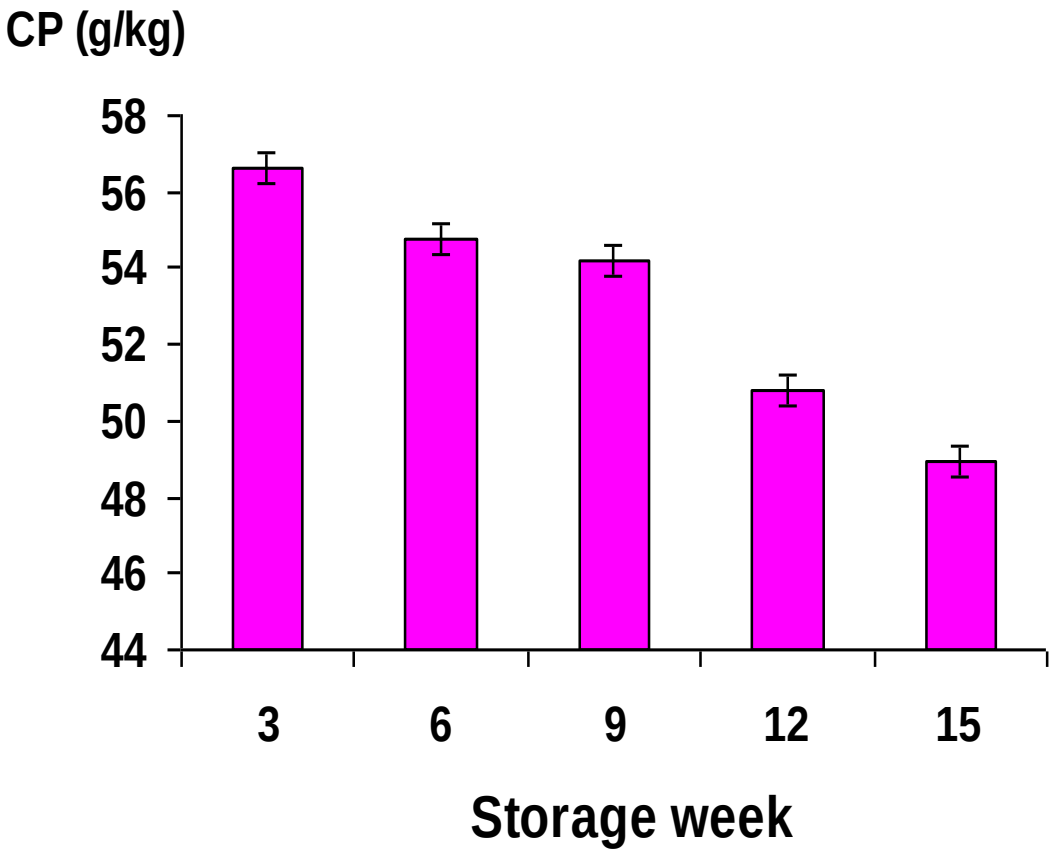
NH_3 after storing time



Crude protein increase 1.6 times after treatment



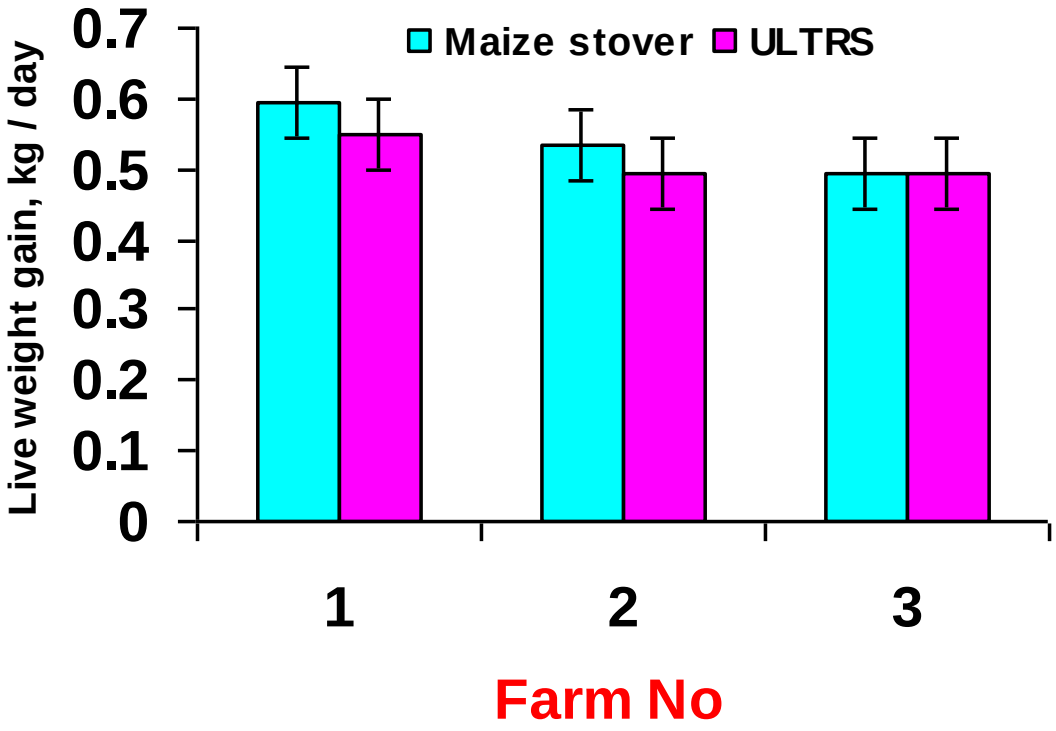
CP decrease follow to storage time



Urea-line on fresh rice straw

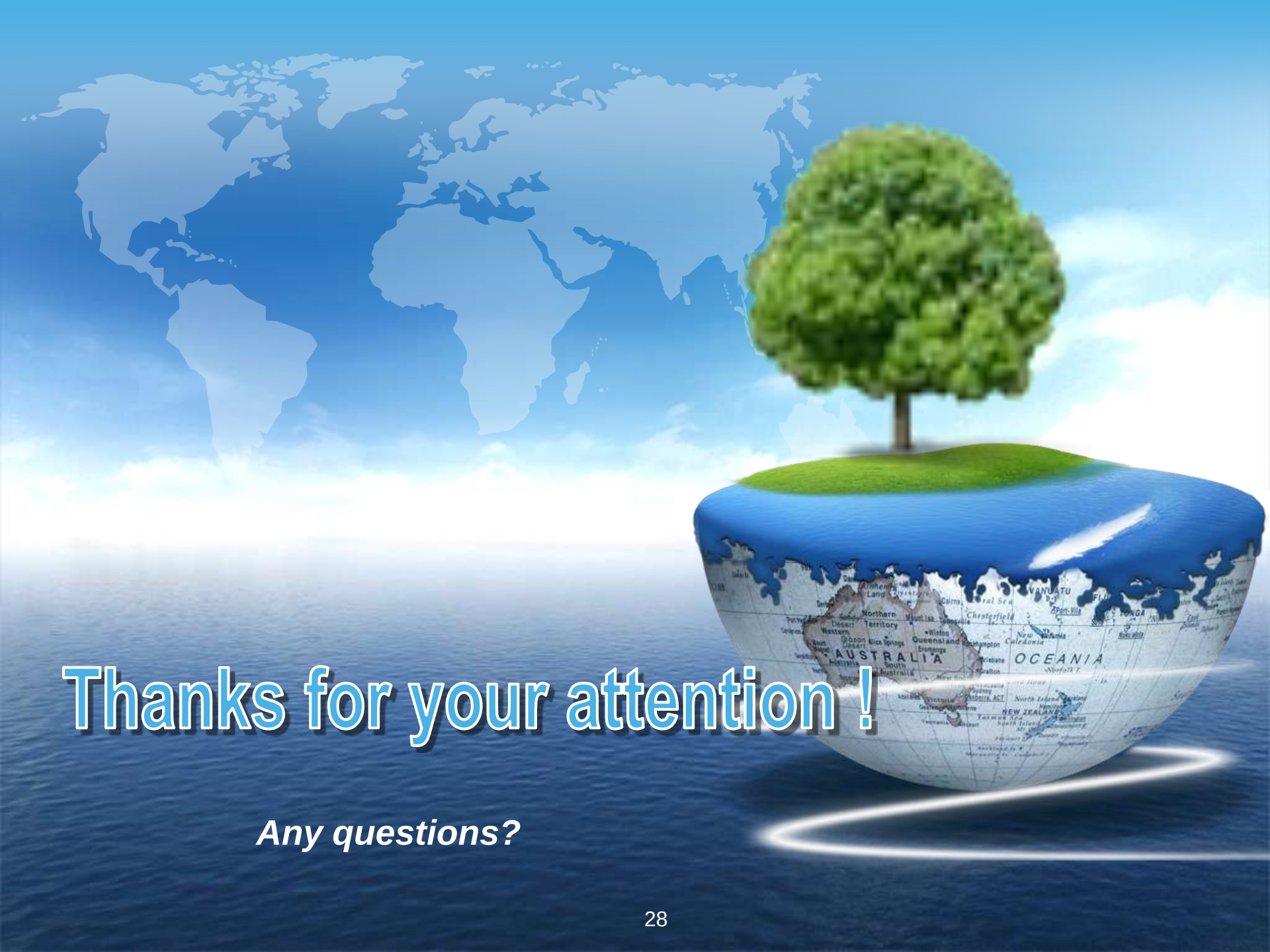
- Replacing green maize stover with urea-lime-treated rice straw (3% urea + 3% lime)

Replacing green maize stover with urea-lime-treated rice straw



Conclusions

- **Fresh rice straw was preserved for at least 15 weeks with improved nutritional value by treating with a combination of urea and lime**
- **A diet of 70% treated straw and 30% maize stover (DM basis) supported similar growth rates (about 500 g/day) as a diet of 100% maize stover**


Thanks for your attention !
Any questions?
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