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Nitrogen Content and Fertilizer Quality in Central Myanmar

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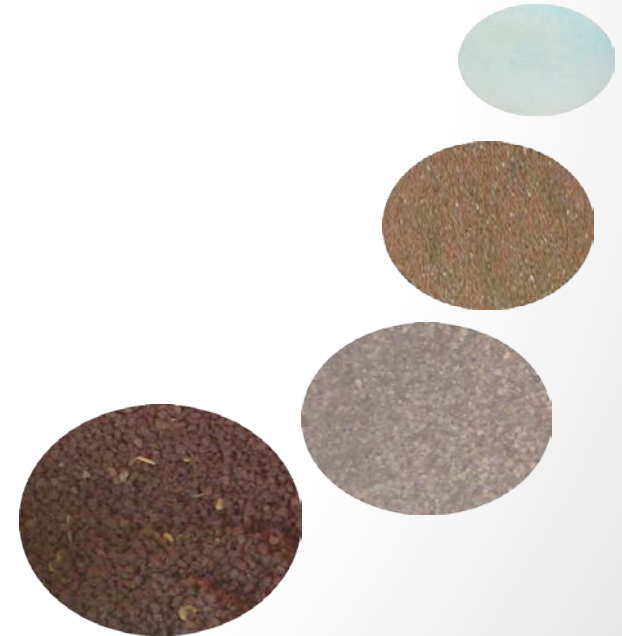
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Outline

- Background
- Materials and Methods
- Results and Discussion
- Recommendations



Background

- Nitrogen (N) fertilizer has been recognized as a key fertilizer in fertilizer marketing.
- Farmers are the main decision makers on the use of mineral fertilizers and they need reliable information on fertilizer quality
- Fertilizer quality issues such as low quality fertilizer through cross-border trade (GAFP, 2016) and improperly labeled bags are often found in local markets.

Background...

- There is a lack of regular assessment in fertilizer quality control programs in the laboratories of LUD.
- There are limited studies of fertilizer quality, particularly in central Myanmar encompassing the Central Dry Zone and upper Bago District.

Objectives

- To assess the state of fertilizer quality and quality control in central Myanmar
- To evaluate the performance of the laboratory analysis of nitrogen in fertilizers

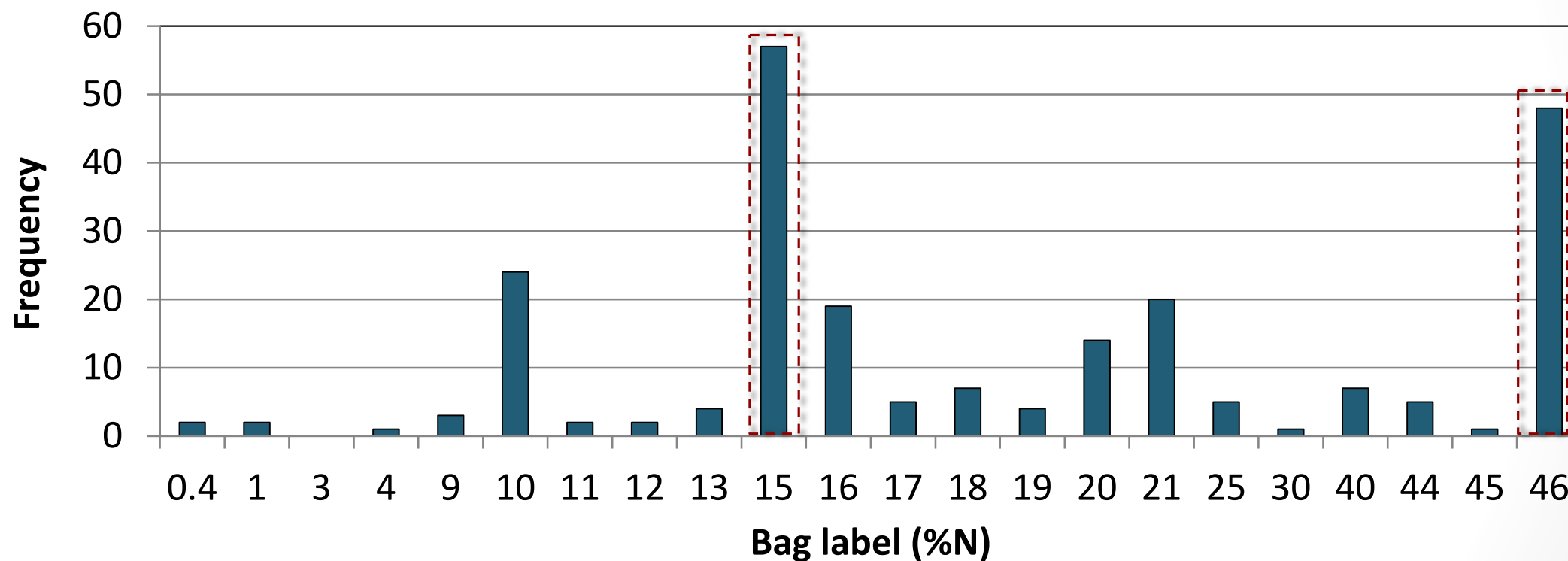
Materials and Methods

- ***Survey Townships:*** Pyinmana, Tatkone & Taungoo
- **Type of dealers:** wholesaler, retailer & local distributors
- **75** dealers (about 78% of total dealers); **233** fertilizer samples were randomly collected
- **10** inspectors
- **Total contents of N** were determined by using Kjeldahl method in LUD laboratory (Horwitz et al., 1970) and C/N combustion method in UoM (LECO combustion at 1350 °C in a stream of oxygen)



Results and Discussion

Types of N fertilizers found in the local market in 2016



Average fertilizer sales in the surveyed region in 2016

Townships	Sold N%	Sold P ₂ O ₅ %	Sold K ₂ O%	Others %
Pyinmana	58	18	19	5
Tatkone	61	20	18	1
Taungoo	70	11	6	13

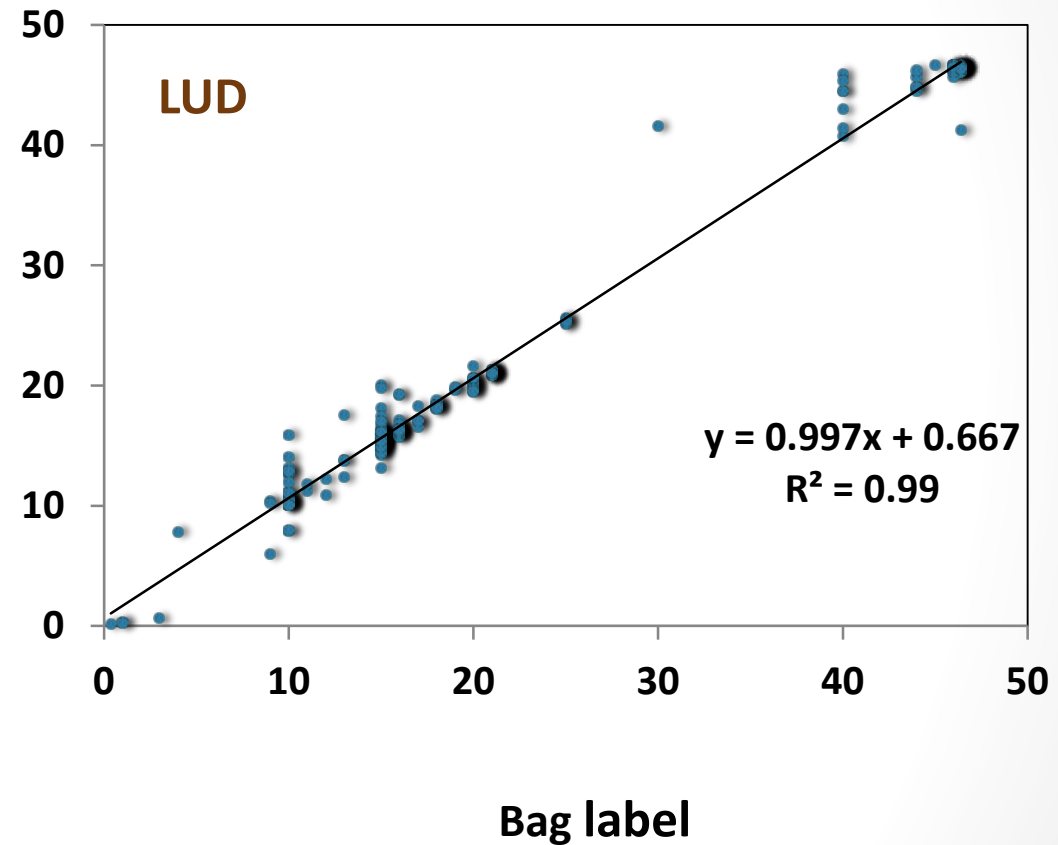
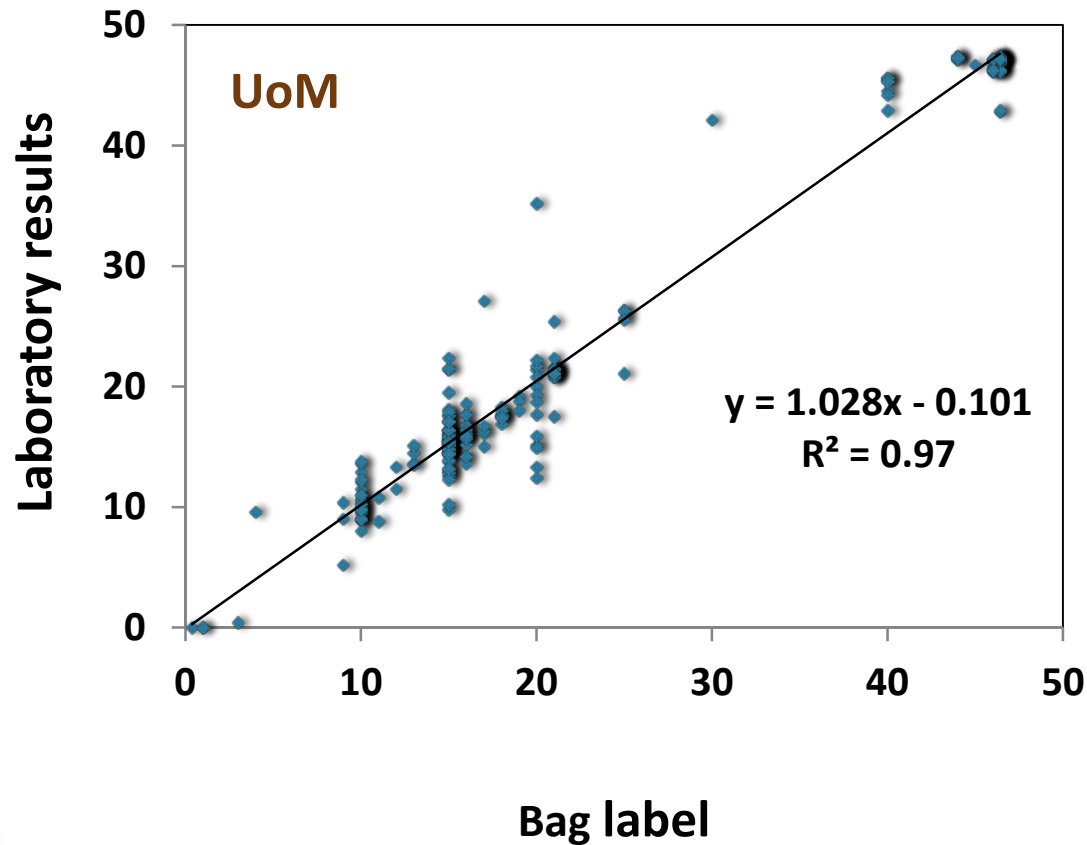
Quality of inspected N fertilizers

Physical characteristics of fertilizers

- ***Caking***-About 17%, 13% and 9% of urea samples from Pyinmana, Tatcone and Taungoo Townships, respectively
- ***Impurity/Adulteration***-No obvious
- ***Granular degradation*** -one brand of urea fertilizer



Chemical characteristics of fertilizers



Relationship between % N figures for the UoM and LUD laboratories and bag label for commercial fertilizers obtained in the survey region

Frequency of fertilizer samples deficient in N

Bag label (%N)	Sample size (n)	Deficient products (n)	Average lab results* + Tolerance limit	SED
0.4	1	1	0.18	
1	2	2	0.76	0.05
3	1	1	1.13	
9	3	1	6.49	
10	24	2	8.42	0.02
12	2	1	11.36	
13	4	1	12.89	
15	57	4	14.85	0.29
46	61	1	41.43	

* Results based on those determined by LUD lab

Fertilizer bag labeling



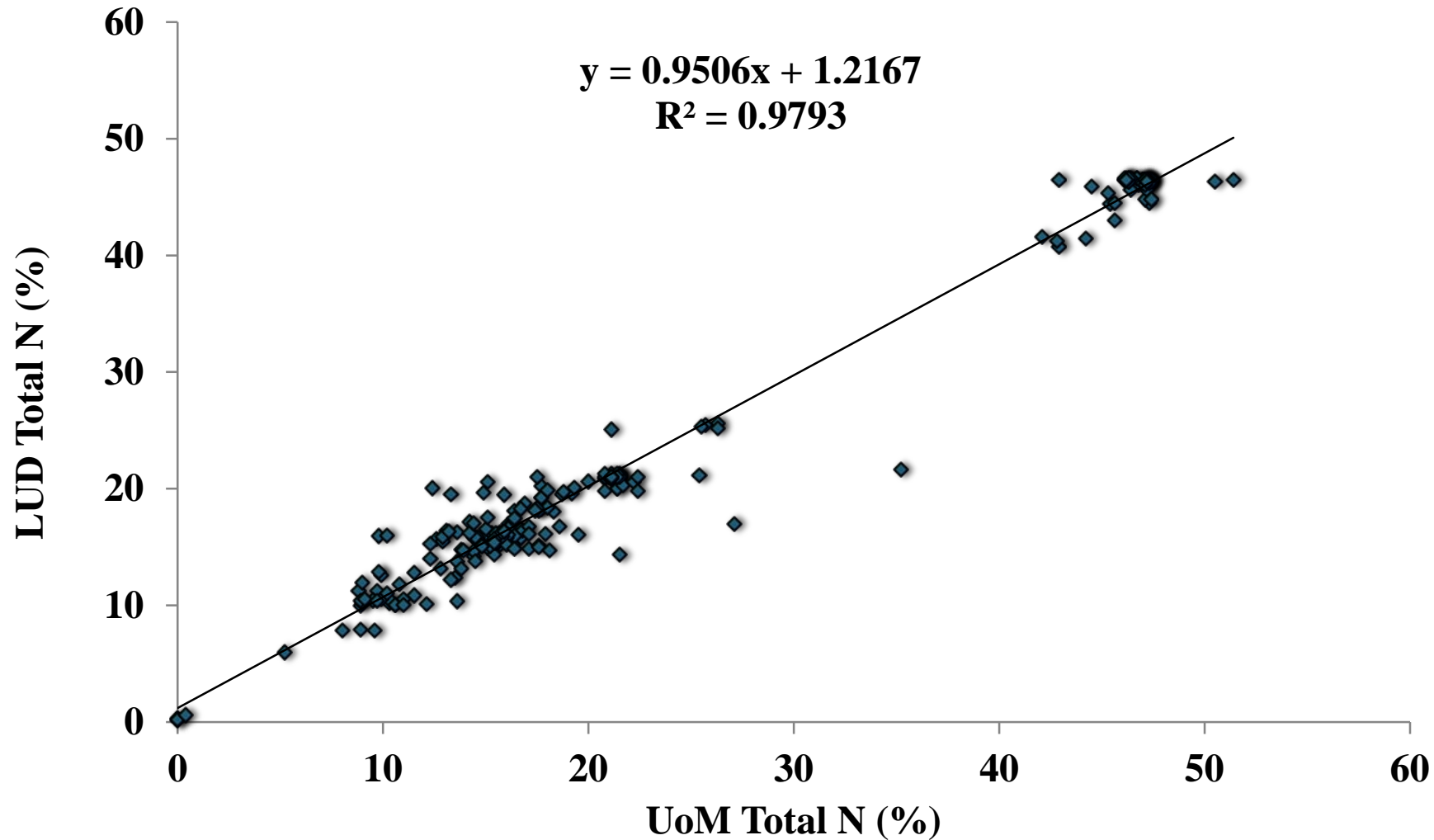
Three brands of products are improperly labeled.

Storage facilities

- Most dealer shops had inadequate storage conditions with high relative humidity (34%), poor ventilation (73%), and lack of pallets (77%).



Assessment of local fertilizer testing laboratory's capability



Comparison of total N content (%) of the fertilizers as determined by the LUD and UoM laboratories

Factors influencing fertilizer quality in the local market-survey results

- *Frequency of inspection*- on average one inspector visits one time per year
- *Resourcing of inspectors*-inadequate numbers of inspectors
- *Import control*-weak border control
- *Product information*-delay in providing up to date product information at township level
- *Training*-lack of training on quality control of products
- *Analytical response times*-slow feedback from the laboratory

Conclusion

- N-based commercial fertilizers in local markets were generally adequate, as only 6% of total inspected fertilizers, primarily NPK compound fertilizers, were deficient in N content.
- The LUD laboratory is be competent for monitoring and regulation of fertilizer quality in terms of N content.

Recommendations

- In terms of N fertilizer quality control, fertilizer inspectors should concentrate their monitoring effort on *NPK compound fertilizers* and *blended fertilizers*;
- *Stringent import agreements* should be entered into with neighbouring countries. Fertilizers without appropriate certification should be denied entry.

Recommendations

- Since the number of fertilizer inspectors and budget are limited, policy makers should *assigned more inspectors* at township level and provide *additional budget* for increasing dealer visit and product sampling;
- *Regional laboratories* should be established to provide quick feedback to the dealers;

Recommendations

- The concerned institutes should *provide dealer training*. A *joint training program* of fertilizer quality control with private and public sectors should also be held; and
- To update the commercial fertilizer information immediately after the meetings of fertilizer committee, the concerned institute should *establish official website of the product information*.

Thank you for your attention!