Site-Specific Nutrient Management in Rice and Fertilizer Recommendation in Myanmar

By

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Introduction

➢Myanmar's current population is 53.90 million - 70 % live in rural areas and engage primarily in agriculture.

➢Agriculture plays a vital role in the country's economy.

➢The main crops are cereals (rice, maize, and wheat), pulses, and oilseed crops (sesame, peanut, and sunflower).

➢Rice covers approximately 50 % of the total sown area.

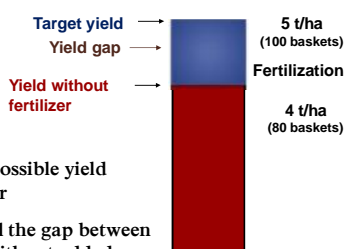**Rice Growing Area in Myanmar**

• Rice growing area

Need for an improved approach to nutrient management for rice

➢Nutrient need for rice

- can differ from field to field
- can differ year to year (varying climate and growing season conditions)

➢The relatively low yield level

➢Production constraint – Soil with low fertility

➢Constant removal and taking up nutrient from soil

➢Soil fertility decline gradually

The SSNM approach

1. Establish a target yield

Target yield →
Yield gap →

Yield without fertilizer →

5 t/ha (100 baskets)
Fertilization
4 t/ha (80 baskets)

2. Obtain the highest possible yield without added fertilizer

3. Apply fertilizer to fill the gap between target yield and yield without added fertilizer

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Omission plot technique

➢ To estimate fertilizer requirements.

➢ Adequate amounts of all nutrients are applied except for the nutrient of interest (the omitted nutrient).

➢ The yield in an omission plot is related to the indigenous soil supplying capacity of the omitted nutrient.

➢The yield gap (target yield - the yield in the omission plot) - calculate fertilizer requirements.

➢ Omission plots make any nutrient limitations visible.

Omission Technique on farmer's field

Omission plot design

Full fertilization	-N	-P	-K	-S	+Zn
+NPKS	+PKS	+NKS	+NPS	+NPK	+NPKSZn

The principle of R.T.O.P

- Reaching toward optimum productivity based on soil indigenous level in specific area
- Dynamic adjustments in fertilizer N
- Effective use of indigenous nutrient
- Efficient fertilizer N management through the use of L .C .C
- Use to determine the requirements for P and K
- Use of tested S and Zn assessment

Methodology for RTOP

Plot size - 5m x 5m = 25 m^2

Total Plot – 6 plots

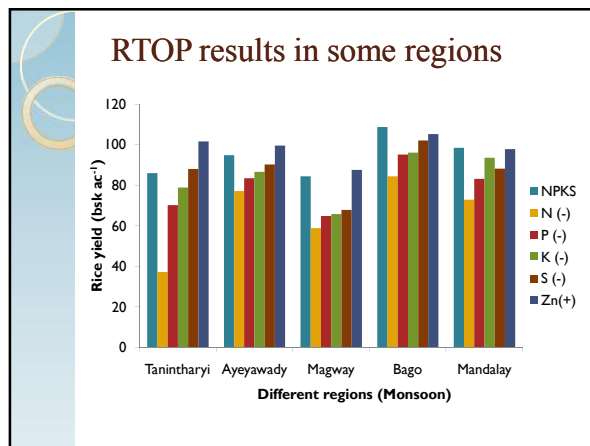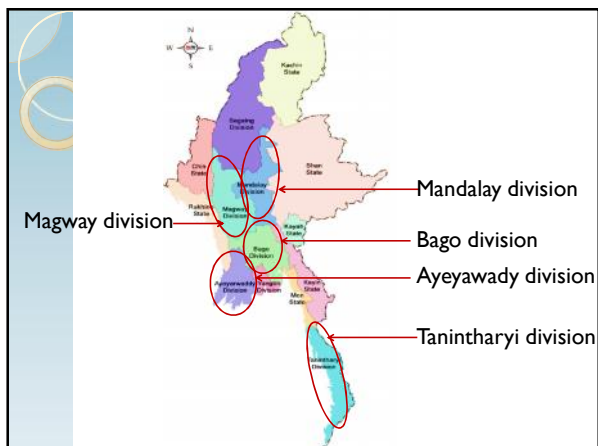Bunds between plots – 25cm x 25cm (to limit nutrient movement)

Fertilizer application rate and name of fertilizer

Nutrient	Fertilizer	Total rate (kg ha^{-1})	Plot rate (g plt^{-1})	Time of Application
N	Urea	100 N	540	3 time
P	TSP	50 P$_2$O$_5$	270	Basal
K	Potash	60 K$_2$O	250	2 time
S	Gypsum	11 S	375	Basal
Zn	Zifer	5 Zn	60	Basal

RTOP implementation in regional offices of LUD (2011-2015)

1. Yangon division
2. Mandalay division
3. Naypyidaw division
4. Sagaing division
5. Bago division
6. Ayeyawady division
7. Magway division
8. Tanintharyi division
9. Kachin state
10. Kayar state
11. Kayin state
12. Chin state
13. Mon state
14. Rakhing state
15. Shan state (East)
16. Shan state (North)
17. Shan state(South)

RTOP results in some regions

Based on (5) years observation

Generally,

- Full fertilized plots give the highest yield in every regions.
- (-N) plots yield - significantly different from full fertilized plots.
- (-P) plots and (-K) plots yield - depends on indigenous nutrient level of each region.
- S and Zn also necessary for soil fertility improvement.

For N, P and K fertilizer recommendation

- Full plot Yield - omission plot yield = nutrient response
- 100 - 70 = 30 * 3.7
  = 111 lb urea
- TSP= 100-85= 15*2.5= 37.5 lb
- MOP= 100-80=20*2.5=50 lb

Fertilizer recommendation for selected regions

Regions	Urea (lb ac⁻¹)	TSP (lb ac⁻¹)	MOP (lb ac⁻¹)
Tanintharyi	232.73	74.57	52.9
Ayeyawady	84.81	41.68	33.85
Magway	152.63	88.13	85.95
Bago	90.05	33.87	31.55
Mandalay	102	38.3	12

Future plan for development of SSNM in rice and fertilizer recommendation

Develop SSNM and fertilizer recommendations
- In different locations and different rice varieties

Evaluate and improve SSNM recommendation
- N management Combine with LCC, use of P, K, S, and Zn in SSNM recommendation
- Measure profit based on fertilizer costs and rice yield
- Include addition plots

Demonstrate and promote fertilizer recommendations
- Farmer meetings and farmer field days

  Use nutrient omission plot technique in farmer field

Thank You!