

# Soil nutrient limitations define farming systems in the Central Dry Zone of Myanmar

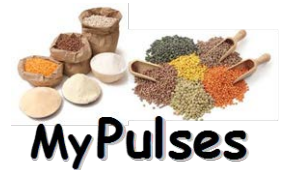
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# The Central Dry Zone of Myanmar

Pulse dominated,  
with sesame

Intercropping  
common

Monsoon and post-  
monsoon crops

Sandy surface soil

Increasing clay with  
depth and latitude

500-1000 mm  
monsoonal rainfall





# Sample collection

2013 soil survey  
across the CDZ  
collecting over  
300 samples

Farmers  
identified 'Good'  
and 'Bad' areas



# Results summary

**Table 1. Mean values for soils considered 'good' or 'bad' for yield in CDZ**

Soil test value	Bad (N=136)	Good (N=183)
pH	7.7	7.7
EC	0.09	0.10
Olsen P (mg/kg)	6.0	6.8
Water-extractable S (mg/kg)	9.5	10.7
OM (%)	0.74	0.80
Available N (mg/kg)	40	45
Exchangeable K (cmol/kg)	0.25	0.28
Clay (%)	9.9	12.5
ECEC (cmol/kg)	12.7	15.1
Sodicity (%)	4.6	4.3
Hot water extractable B (mg/kg)	1.1	1.2

Screened for samples  $\leq$  critical values there was no difference between sites thought Good and Bad

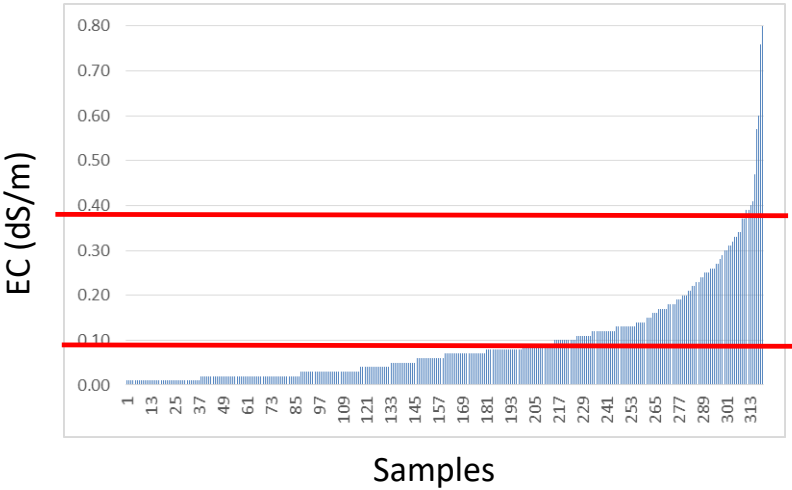
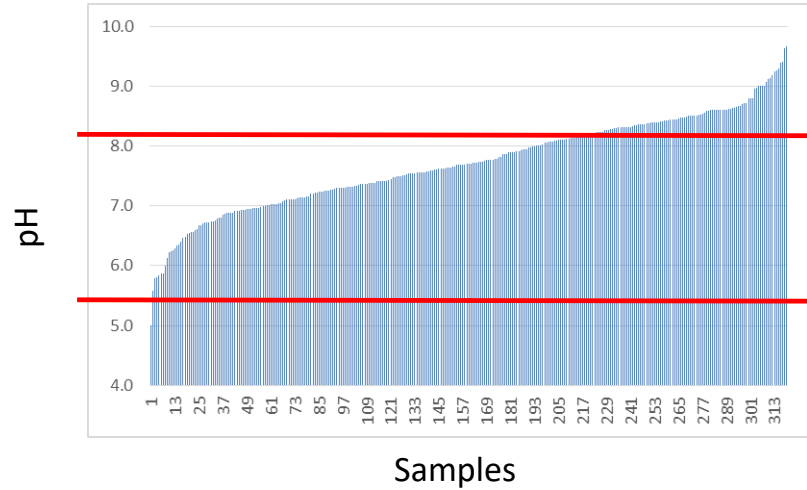




# pH and EC

pH (1:5 H <sub>2</sub> O)	Number of samples (%)	Rating
<5.5	0.3	Acid
5.5-8.3	72	Neutral
>8.3	28	Alkaline

EC (dS/m) (1:5 H <sub>2</sub> O)	Number of samples (%)	Rating
<0.07	58	Low
0.07-0.38	39	Medium
>0.38	3	High



# Phosphorus and sulfur status

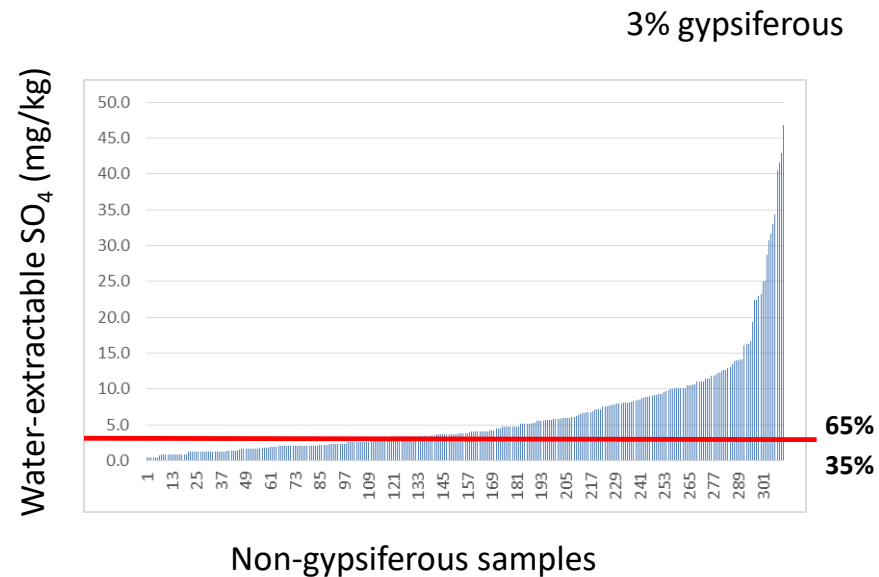
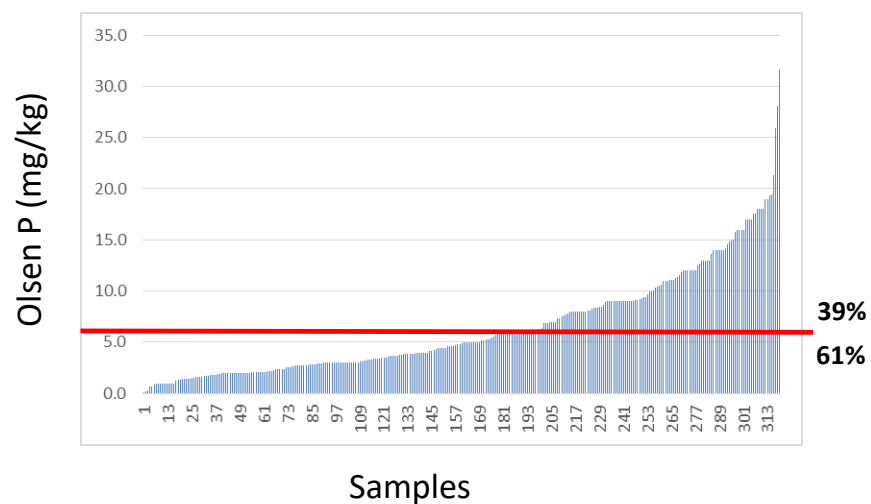
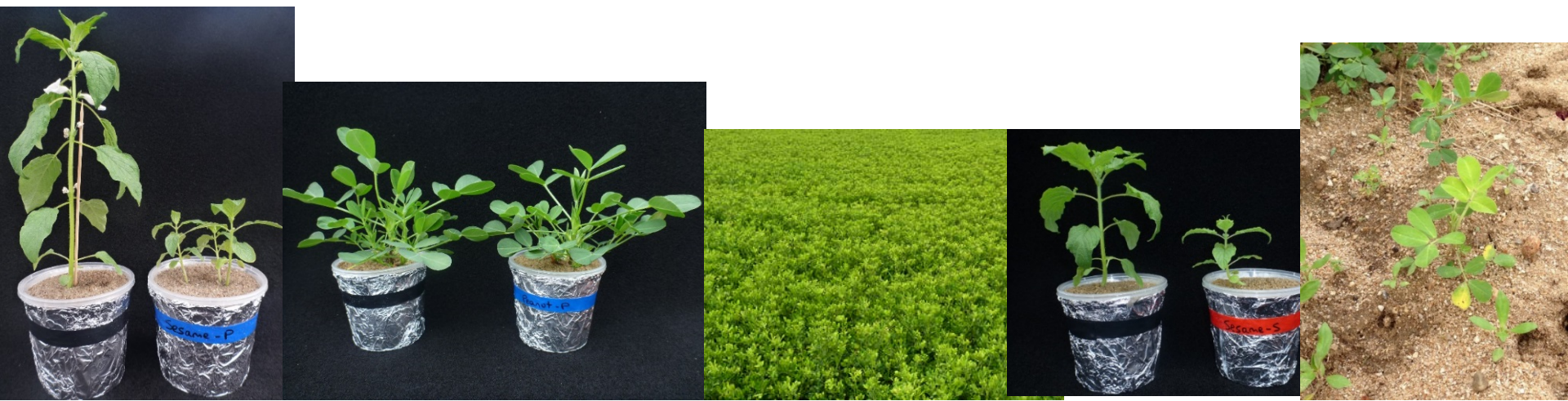


Figure 1 Range of values for available P and S in 319 surface soil samples from the CDZ



# Clay and organic matter status

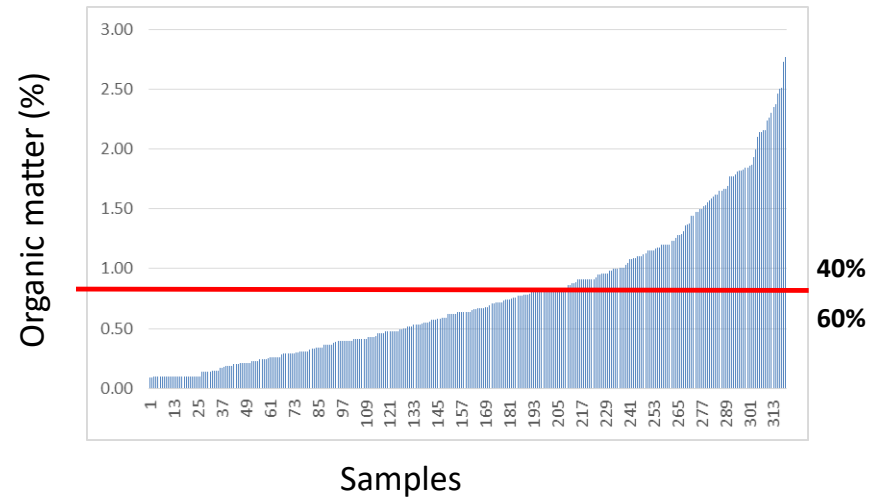
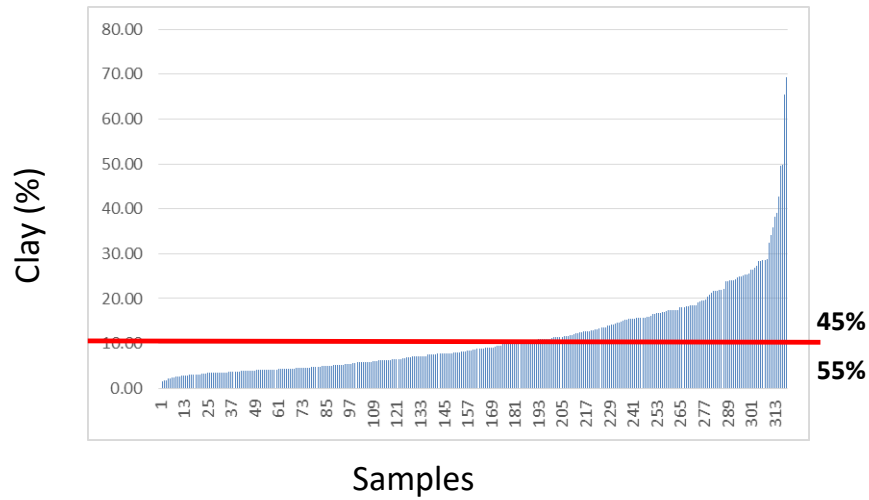
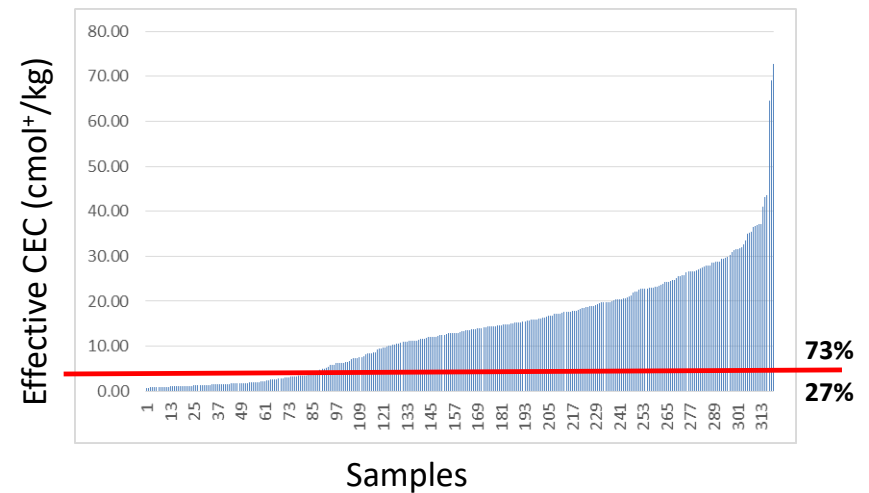
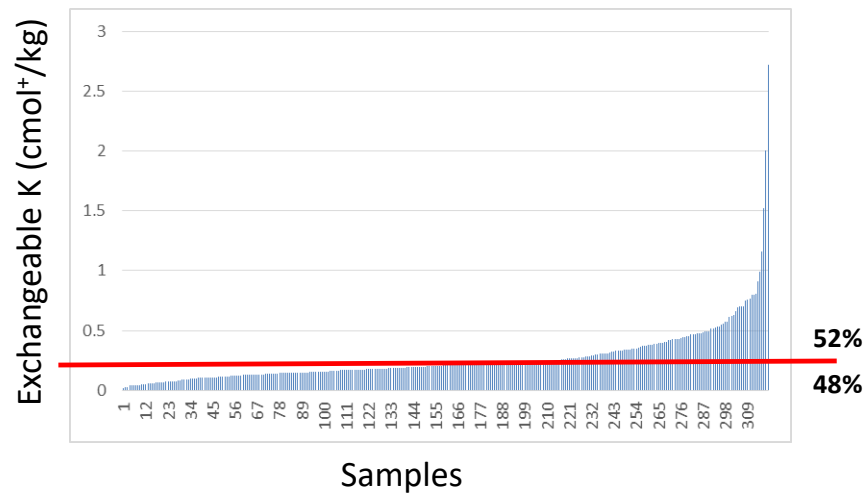


Figure 2 Range of values for clay and organic matter percentage in 319 surface soil samples from the CDZ





# Cation fertility status



**Figure 3** Range of values for exchangeable K and effective cation exchange capacity in 319 surface soil samples from the CDZ



One third of sites were sodic (ESP >6%) BUT only one third of those sites had more than 10% clay





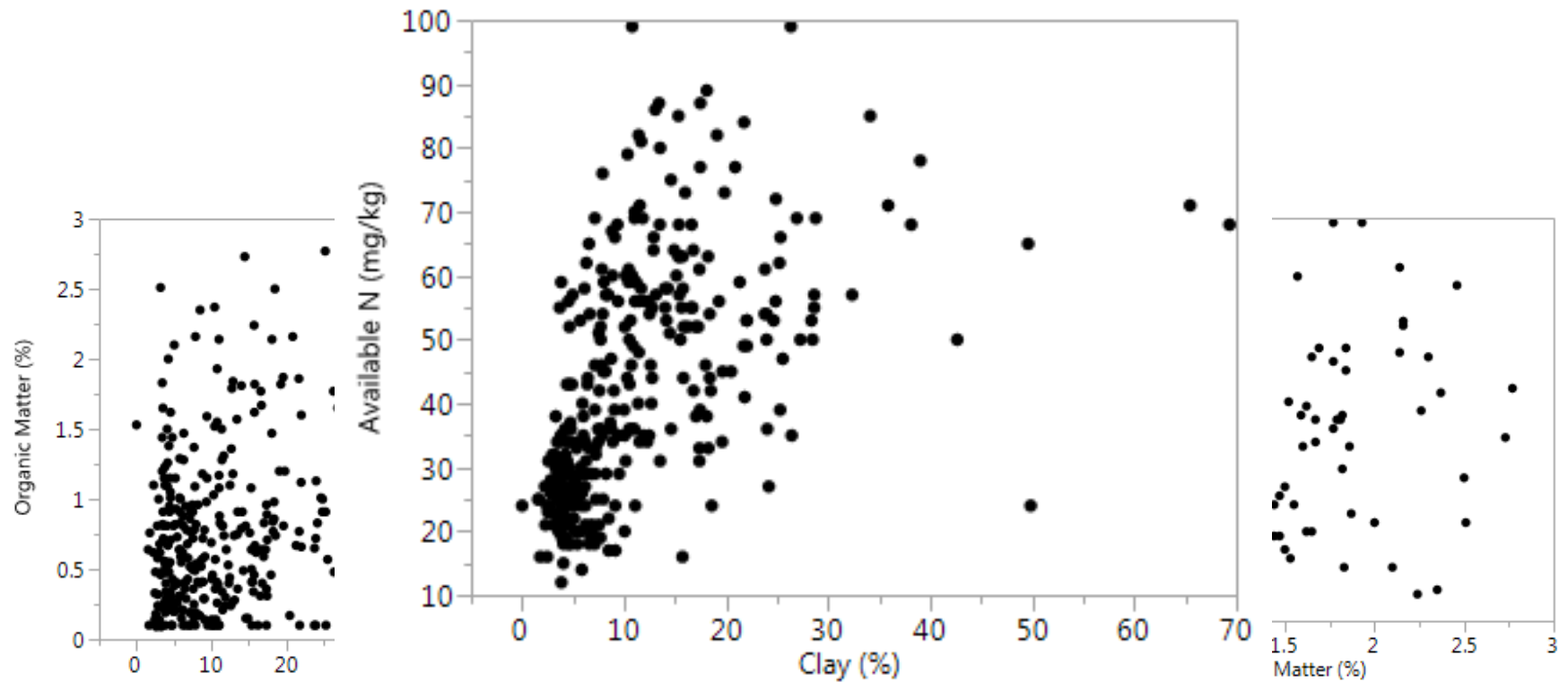
# Conclusions

- Extensive deficiency in P, K and S associated with low organic matter and clay
- Multiple deficiency in 18% of sites (low P, K and S)
- Response to fertiliser *should* be extensive



# Reflections

- Trouble shooting results and rigorous QA is critical going forward in Myanmar





# Thanks

## Questions?



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