APPSA 2nd SCIENTIFIC CONFERENCE

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Baseline Study of Soil Nutrient Status in selected modal profiles for smallholder fields in the Mafeteng district, Lesotho

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Introduction

- Deterioration of soil fertility : serious challenge for crop production and productivity.
- Production management system that is biased towards cereal crops which remove lots of nutrients from the soils and failure to manage the soils properly.
- soil acidification (especially in the lowlands and foothills) as the most important cause of declining soil fertility

Introduction

- Nitrogen levels are low and often associated with low (<1%) soil organic carbon content typical of lowlands soils
- Phosphorus deficiency in most important local soils (in some benchmark soils applied P retention is alarming up 80%!!)
- The low productivity of smallholder agriculture is attributed to poor access to production resources. Lack of support for soil analysis and recommendations results in incorrect fertiliser inputs and, consequently, low crop yields.

Objective

- To provides an overview assessment of the soil nutrient status of smallholder farms based on analysed soil samples detailed description

Study area

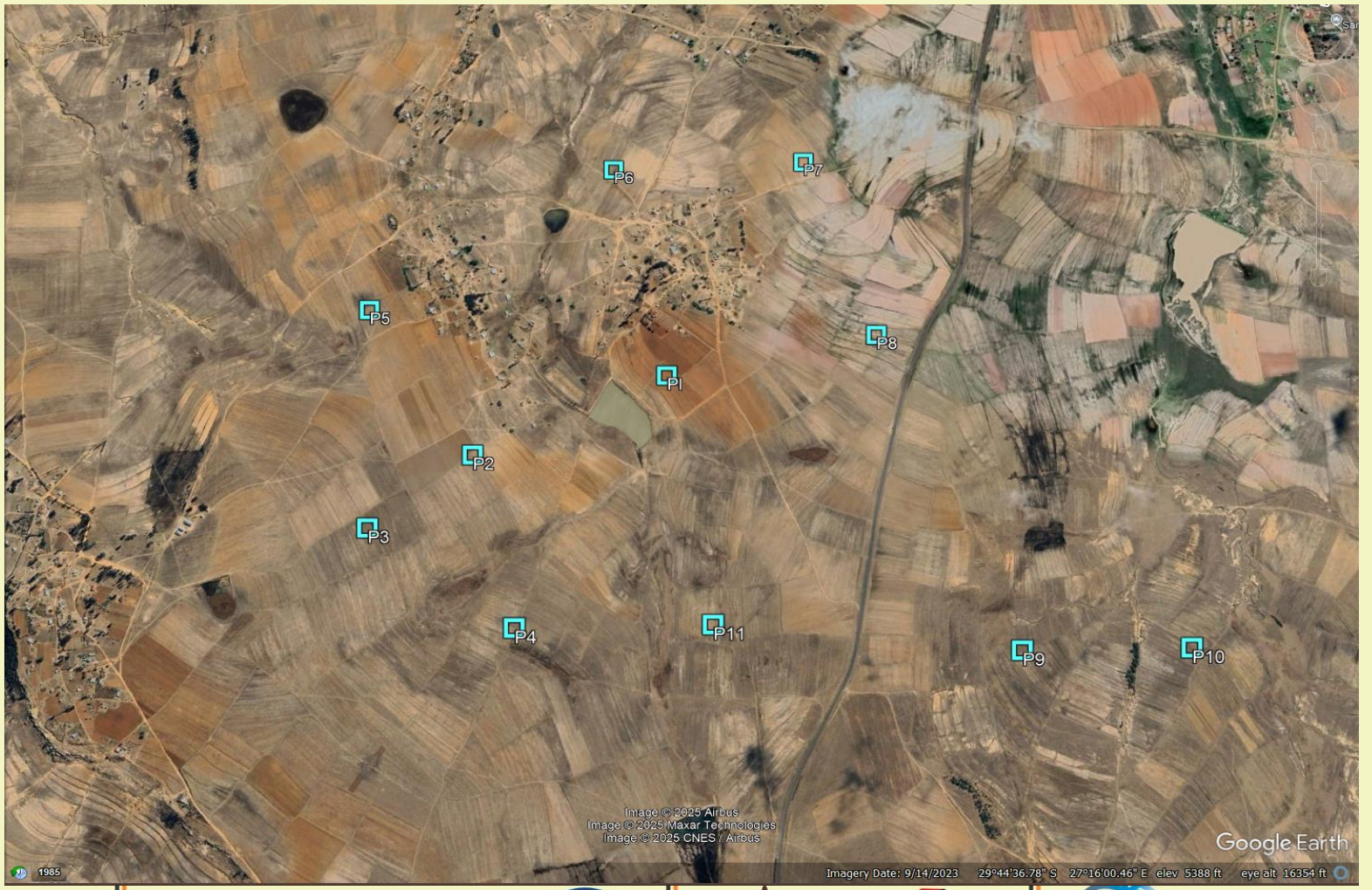

Leribe
Berea
Mokhotlong
Thaba Tseka
Lesotho
Maseru
Morija
Mafeteng
Semonkong
Qacha's Nek
Maloti
Zastron
Quthing
Matatiele
Cedarville
Palmietfontein
Sterkspruit
Tlokoeng
Ficksburg
Ladybrand
Nchu
A1
A2
A3

Methodology

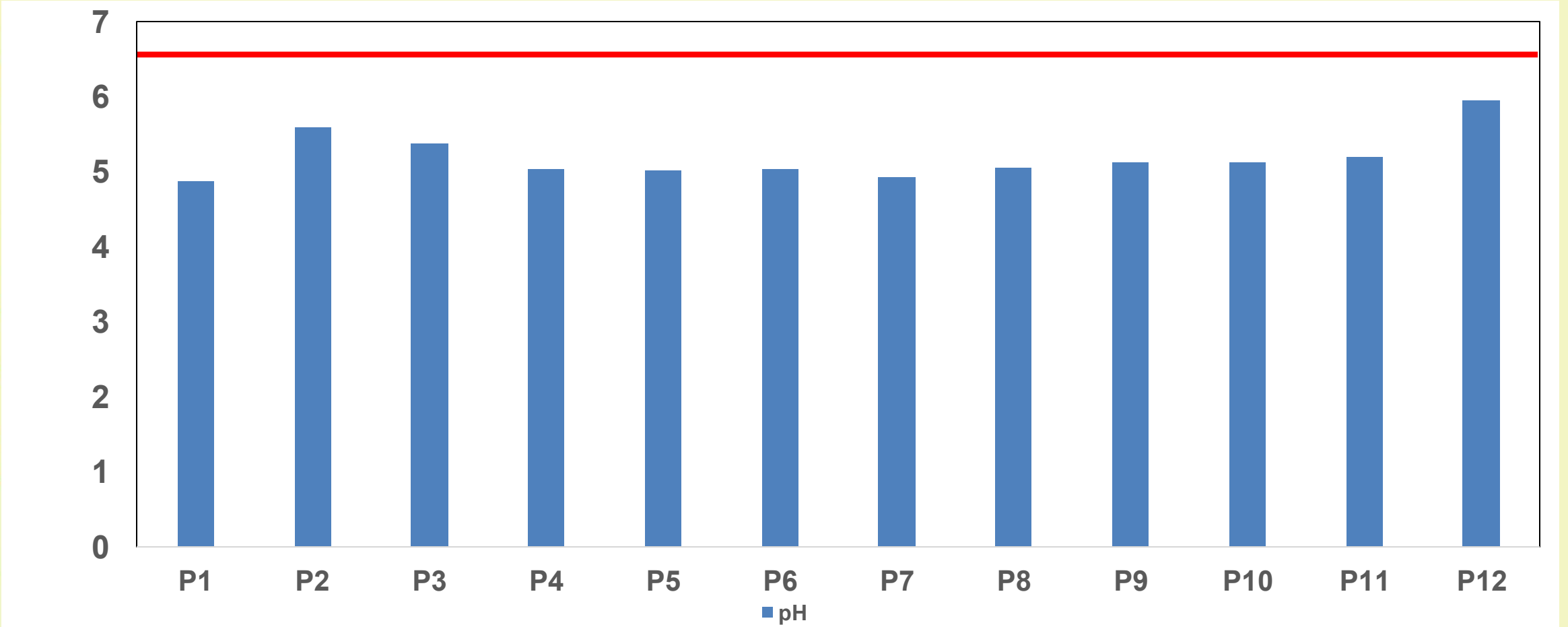
- Assessment was done using transect walks in a catena sequence to characterise both individual pedons properties soils relationships both above and below landscape

- The main soils were identified using auger traverses and recording observations on morphological features and samples taken for laboratory analyses

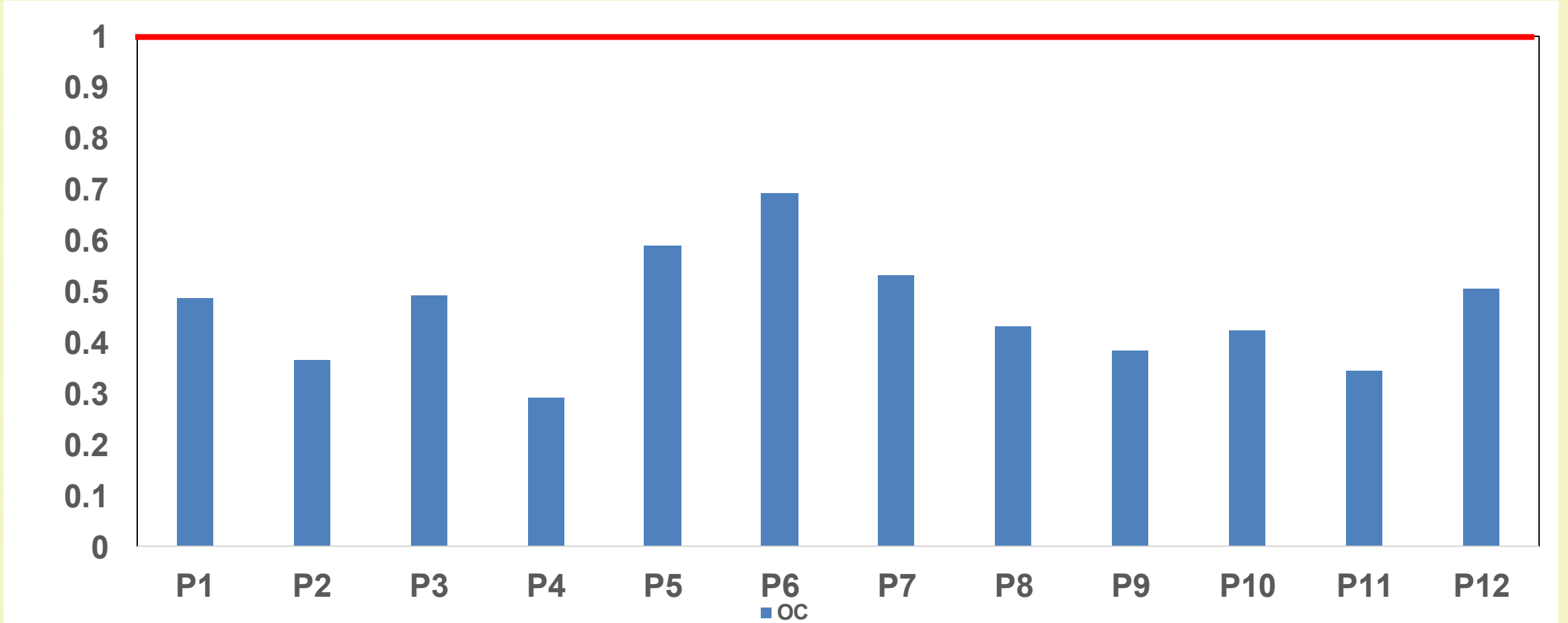
Sampling points



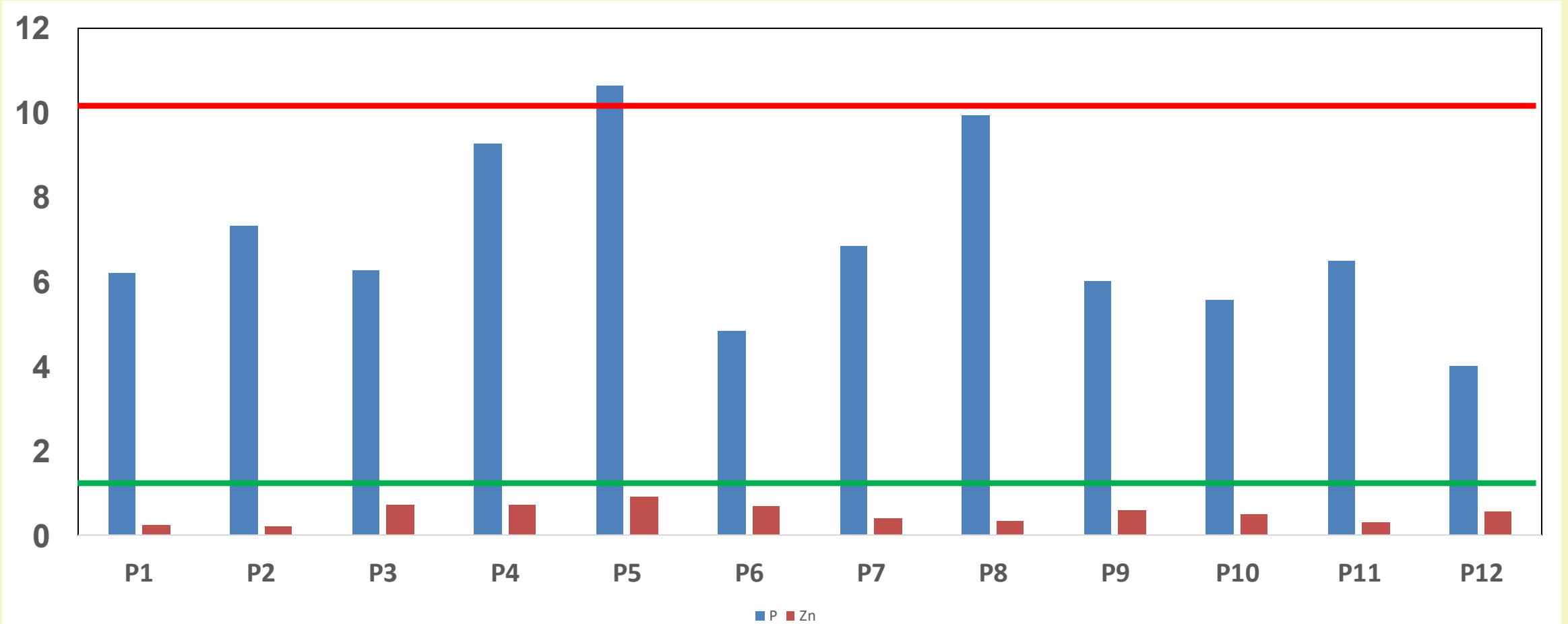
Results (pH)



OC (%)



P and Zn (mg/kg)



Results

	pH	OC	P	Zn
Min	4.88	0.29	4.00	0.21
Max	5.95	0.69	10.66	0.92
Mean	5.19	0.46	6.96	0.53
SD	0.31	0.11	2.03	0.22
CV	5.97	24.21	29.18	42.21

Soil types at selected trial sites

- Leribe series (Ferralic Cambisols)
- Berea series (albic plinthosols)

Selected properties (Leribe series)

Soil series	Horizon	Depth (mm)	Matrix colour (moist)	our ttles)	cause (mottles)	Structure	Clay
Leribe	ap	0-150	7.5YR 4/4			weak sub angular blocky	20
	Bt1	150-300	5YR 4/4			weak sub angular blocky	30
	Bt2	300-600	5YR 4/4			weak sub angular blocky	35
	Bt3	600-1200	2.5YR 4/6	ck	and Mn^{3+} Fe^{3+}	medium angular block	40

Selec eries)

Soil series	Horizon	Depth (mm)	e (mottles)	Structure	Clay
Berea	ap	0-200		weak sub angular blocky	15
	Bt1	200-600		weak sub angular blocky	26
	Bt2	300-600		weak sub angular blocky	31
	Bt3	600-800			33
	Bv	600-1200	Fe^{3+} Fe^{2+}	medium angular block	42

Conclusion

- Soil fertility indicators shows low fertility of soils in this area
- Farmers management practices
- Samples showed small variability across observation points
- Detailed analyses recommended
- Good soil management practices needed (strengthened extension service)

Acknowledgements

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