Introduction

- Urbanization increases demands for food and pressure on available arable land (Figure 1).
- Intensified multiple cropping systems play a major role in balancing these two drivers.
- Frequent application of high inputs on weathered tropical soils affects resource use efficiency and productivity of agricultural systems.
- On weathered tropical soils, nutrient leaching leads to major nutrient losses in the system.

Methodology

- An on-station field experiment, started in 2016 at GKVK campus of the University of Agricultural Science, Bangalore, India, mimics a typical cereal-vegetable cropping system at three levels of N (intensification stages) under (drip-)irrigation.
- Cabbage, eggplant, tomato in the dry season Rabi (February – June) are followed by millet, lablab and maize in the Monsoon season Kharif (July – November).
- Leaching data were recorded using in-situ monolithic free drainage lysimeters which were installed in the plots with low (control) and high N during Rabi and Kharif seasons 2017 (Figure 2).
- Lysimeters were emptied weekly and the nutrient concentration in the leachates was determined by ion-chromatography.

Results and Discussion

- Leaching volumes were higher during the Rabi season with continuous drip irrigation than in Kharif with life-saving irrigation (Fig 3b).
- N leaching occurred in both Kharif and Rabi seasons, and was highest for tomato. Rabi had higher K leaching compared to Kharif season.
- S leaching was high in low fertilized plots of cabbage (in Rabi) and millet (in Kharif).

Conclusions

- High leaching losses during the Rabi seasons give evidence that inputs were not used efficiently in any of the simulated agricultural management scenarios.
- Low leaching of S from the millet plots may be a carry-over effect caused by strong S uptake in cabbage grown in the previous Rabi season.
- Cabbage plots without N showed high leaching losses of S, probably due to low S uptake by the crop.

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