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# PROCEEDINGS

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## **Iron toxicity of lowland rice cultivated soils immediately after flash floods in Mapalana and Nayimbala, Sri Lanka**

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Iron (Fe) toxicity is one of the major constraints in lowland paddy soils in Southern Sri Lanka. The toxicity is associated with reduced soil condition of flooded soils, which increases concentration of iron ( $\text{Fe}^{2+}$ ). Iron concentrations of natural origin are region-specific, and differ even within localized areas due to various soil types. Unlike other crops, rice can cope with excess water stress. However, according to the flash flooding or deep-water flooding the gas diffusion may limit in paddy soils. Flash flooding, may last less than a few weeks causing after heavy rainfall although the depth of water limits a few meters, however, deep-water flooding, the water depth reaches several meters for several months. The heavy rainfall during May 2017 in Mapalana area caused severe floods by damaging the lowland rice cultivated areas. In order to evaluate the immediate impact of these floods for iron toxicity, the current experiment was conducted in Mapalana and two sites in Nayimbala. Twelve samples were selected from above areas after one week of floods when water has completely drained. The collected soil samples from 0-10 cm layer were air dried, sieved then analysed for pH, EC, colour,  $\text{NO}_3^-$ -N,  $\text{NH}_4^+$ -N, available K and Fe concentration. All the samples showed pH values less than 5.6 which can be identified as acidic soils. The Fe content of the soil samples collected in Mapalana was  $1594 \pm 308.7 \text{ mg kg}^{-1}$ , Nayimbala site 1 was  $1050 \pm 416.5 \text{ mg kg}^{-1}$  and Nayimbala site 2 was  $1300 \pm 198.8 \text{ mg kg}^{-1}$  which was above the critical level of  $4.5 \text{ mg kg}^{-1}$  of soil. There was a positive strong co-relationship in Fe content with K,  $\text{NH}_4^+$ -N. Similar occurrence of a pronounced peak of Fe immediately after flooding was reported in previous studies. Further studies are continuing on iron toxicity in respective area.

**Keywords:** Flash floods, iron toxicity, rice soils