

DEVELOPMENT OF A TOOL KIT FOR THE IDENTIFICATION OF NITRATE LEVELS IN FORAGES IN THE FIELD

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Nitrate poisoning, mainly due to consumption of excessive amount of nitrate from grazing crops, hay, silage, weeds and drinking of water or waste water, is one of the major problems faced in the dairy industry of Sri Lanka. Though few laboratory methods are already available for the quantification of nitrate levels in forage, a new technique or method is required to practice in the field. An experiment was conducted to find out the suitability of introducing a new method to determine the forage nitrate levels in the field. The new method was developed with a series of experiments and validated with the standard laboratory Salicylic Acid method. A field experiment was conducted in a Randomized Complete Block Design (RCBD) in two factor factorial treatment arrangement, with three replicates to evaluate the effect of plant parts (stems and leaves) and growth stages (15 & 30 and 45 days) on nitrate accumulation, using new method. Data were statistically analyzed using paired t-test and two-way Analysis of Variance (ANOVA) in SAS. Results revealed that the developed method was significantly different ($p < 0.05$) to standard laboratory Salicylic Acid method. However, there was a linear relationship between the two methods. Accordingly, a value of 398.1 ppm nitrate concentration needs to be adjusted with the new method. There was an interaction between two factors in nitrate accumulation ($p < 0.05$). The highest nitrate contents were observed in stems compared to the leaves, which declined with maturity. Thus, it can be concluded that the developed method can be used in the field to measure the nitrate level with few adjustments and that nitrate accumulation in forage depends on plant parts and growth stage.

Keywords: Nitrate poisoning, Plant factors, Salicylic acid method