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Determination of metsulfuron-methyl residues in elephant grass by using (LC/ESI)-Q-ToF-MS/MS (813)

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Elephant grass has been used as animal feed and also in different applications, such as, to protect arid land from soil erosion, to improve the fertility of soil, to use as firebreaks and windbreaks, and to produce bio-oil, alcohol and charcoal. However, one of the its limitation in field implantation in large scale is the interference of weeds. In order to control the infestation of weeds the application of herbicides has been showed to be an effective method, but due to the toxicity of these substances for the environment and animals, the presence of the herbicides residues in plants must be evaluated. Thus, this work presents an analytical method, which was developed to determine the residues of metsulfuron-methyl in elephant grass by using Liquid chromatography coupled to a quadruplole time-of-flight tandem mass spectrometry (LC/ESI)- Q-ToF-MS/MS. The extraction of the analyte was made by using the QuEChERS method (quick, easy, cheap, effective, rugged and safe). In the clean-up step, besides PSA and $MgSO_4$, florisil was also used to remove the interferents. The separation was carried out on an Acquity UPLC® BEH C18 column (1.7 µm, 2.1mm ID, 100mm) using a gradient elution profile and mobile phase consisting of 0.1 % formic acid in water and methanol (positive-ion mode). The method showed good linearity in the concentration range of 0.001–0.2 µg/mL, ($r^2 \geq 0.99$); the limit of quantification (LOQ) was 20 $\mu g/kg^{-1}$; the recoveries were in the range of 93–120% and the precision (RSD%) was 12.7 %. The method was applied to analyze samples collected after 45 d after treatment with metsulfuron-methyl (7.8 and 15.6 g ha^{-1}) and an untreated check. None of the sample showed the presence of the herbicide residues above of the limit of quantification (LOD). Acknowledgements: Financial support of CNPq and FAPEMIG is highly acknowledged.

Keywords: Pennisetum purpureum, forages, herbicides

The poster in a PDF version is available here.