

# Determination of Metsulfuron-Methyl Residues in Elephant grass by Using (LC/ESI)-Q-ToF-MS/MS

Sonia C. N. Queiroz<sup>1</sup>, Márcia, R. Assalin<sup>1</sup>, Alexandre Brighenti<sup>2</sup>

<sup>1</sup>Embrapa Environment, Jaguariuna, 13820-000, Brazil.

<sup>2</sup>Embrapa Dairy Cattle, Juiz de Fora, 36038-330, Brazil. \*e-mail: [alexandre.brighenti@embrapa.br](mailto:alexandre.brighenti@embrapa.br)

- ✓ Elephant grass has been used as animal feed and also in different applications (Aroeira at al. 2001), such as, to protect arid land from soil erosion, to improve the fertility of soil, to use as firebreaks and windbreaks, to produce bio-oil, alcohol and charcoal (Strezov at al. 2008).
- ✓ One of its limitation in large scale is the interference of weeds.
- ✓ To control the weeds infestation the application of herbicides has been showed to be an effective method.
- ✓ 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 to determine residues of metsulfuron-methyl in elephant grass by using Liquid chromatography coupled to a quadrupole time-of-flight tandem mass spectrometry (LC/ESI)-Q-ToF-MS/MS.

## Results

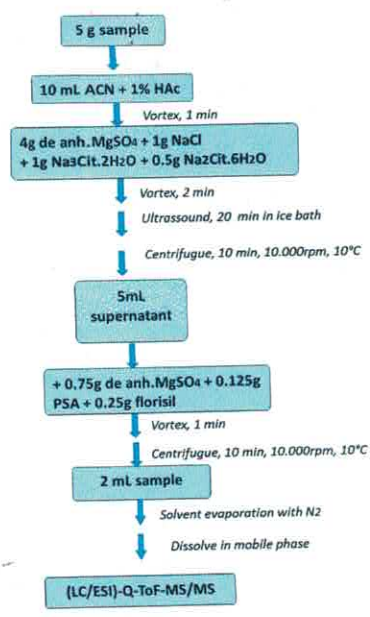
- ✓ The method validation parameters are showed in Table 1.
- ✓ A typical chromatogram is showed in Figure 2.

**Table 1 – Validation parameters of the method.**

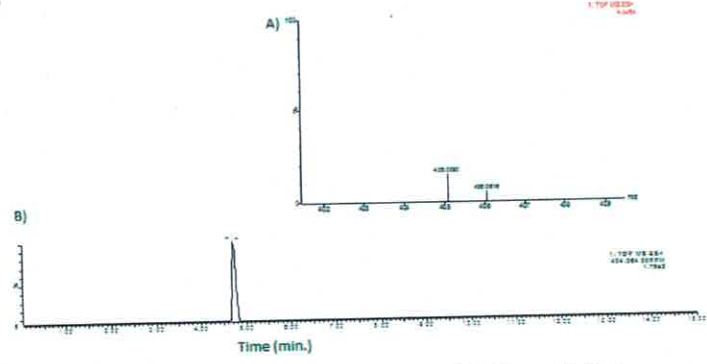
Linearity	0.010-00.2 ug/mL, r2 >0.997
Limit of Quantification (LOQ)	20 ug/kg
Accuracy (recovery%) and Precision (CV%)	
Level 1 (20 ug/kg) (n=5)	109.8 (CV= 12.7%)
Level 2 (100 ug/kg) (n=5)	112.6 (CV=12.8)

## Material and Method

- ✓ The extraction of the analyte was made by using the so-called QuEChERS method (quick, easy, cheap, effective, rugged and safe), Figure 1.
- ✓ 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 was applied to analyze samples (n=5) collected after 45 days from the treatment with metsulfuron-methyl at 1x and 2x of the normal field use rates (7.8 and 15.6 g ha<sup>-1</sup>) and an untreated check.



**Figure 1 – Sample preparation procedure**



**Figure 2 – A) Mass spectrum of metsulfuron-methyl, b) Chromatogram.**

## Discussion

- ✓ None of the sample showed the presence of the herbicide residues above of the limit of detection (LOD).
- ✓ We can suppose that the elephant grass, treated with metsulfuron-methyl, using the studied doses, is safe to feed animals.
- ✓ The method showed be easy, efficient and suitable for quantitaion of residues of metsulfuron-methyl in elephant grass.

## References

Aroeira LJM, Lopes FCF, Soares JPG, Deresz F, Verneque RS, Arcuri PB, Matos LL (2001) Daily intake of lactating crossbred cows grazing elephant grass rotationally. Pesquisa Agropecuária Brasileira 36: 911-917

Strezov V, Evans TJ, Hayman C (2008) Thermal conversion of elephant grass (*Pennisetum purpureum* Schum) to bio-gas, bio-oil and charcoal. Bioresource Technology 99: 8394-8399

## Acknowledgements



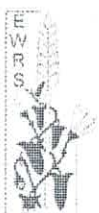


# 7<sup>th</sup> International Weed Science Congress

June 19-25, 2016  
Prague, Czech Republic



## PROCEEDINGS



Czech Weed  
Research Society



CZECH  
UNIVERSITY  
OF LIFE SCIENCES PRAGUE

