

TITLE: IMPACT OF AGROCHEMICAL USE IN VEGETABLE CROPS AND FORESTED AREAS

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ABSTRACT:

Nova Friburgo, localized in Rio de Janeiro State (RJ) is important area of olericulture in Brazil. The implications of excessive increased herbicides not only affects agriculture area, but also reach forest area due leaching of waste. Thus, was observed the necessity to analyze if there are differences in soil quality in cultivated soil and forest soil in watershed known as Barracão dos Mendes. Therefore, the aim of this research study was quantify oxyfluorfen herbicide value and to evaluate effect of agrochemicals on the physical chemical and microbiological characteristics in soils of cultivation areas and in the reserve forests in Nova Friburgo (RJ). In order, 20 samples of surface soil, with known fertility characteristics, were collected at 0-20 cm depth. The oxyfluorfen soil residual concentration was determined in LARP Pesticide-Residue Analysis Laboratory in Universidade Federal de Santa Maria–UFSM. The trace elements, Zn, Mn, Cd, Pb, Ni and Cu, were determinate using EPA method 3051A digestion. For the determination of soil microbial parameter, DNA was extracted from soil samples using Power Soil™ DNA Isolation Kit (MO BIO Laboratories, California, USA) and amplification of the 16S rDNA gene from bacterial was performed by PCR (Polymerase Chain Reaction) and their fragments were separated by DGGE (Denaturing Gradient Gel Electrophoresis). Additionally, each band was identified using GelQuant.NET (Biochem Lab Solutions, n.d.) software. The results demonstrating the highest microbial diversity was found in the cultivated areas, correlated to the phosphorus, potassium, oxyfluorfen and lead variables. Therefore, we analyzed if the following environmental factors: declivity, soil organic matter and agrochemical characteristics had impacts on the bacteria community. This result indicated that there is correlation between bacterial community and agrochemicals application as fertilizers and herbicides in cultivated areas. On the other hand, the highest organic material contents were clearly found in forested areas with lower values of soil microbial diversity. Thus, to date, the greater soil microbial diversity found in cultivated areas does not necessarily indicated higher total organic carbon content, as was observed in the forest area. In conclusion, our present study suggests that bacterial communities were influenced mainly by different soil management and soil chemical properties correlated.

Keywords: soil microbial diversity, heavy metal, oxyfluorfen, herbicide, DGGE (Denaturing Gradient Gel Electrophoresis).

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