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## **Recycling of Agricultural, Municipal and Industrial Residues in Agriculture**

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## **EFFECT OF ORGANIC RESIDUES APPLICATION TO SOIL ON MINERAL NUTRITION OF WINTER WHEAT**

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Excessive use of mineral fertilisers results on an economical and environmental disadvantage. On the contrary, organic wastes can be recycled as a source of plant nutrients, namely N, as well as enhance the future crop production by improving the quality of the soil in terms of organic matter content. With sight to supply part of the plants needs for nitrogen (N) and simultaneously to compensate the losses of organic matter that occur in the majority of the generally poor Portuguese soils, it was tested the application of organic residues to the culture of winter wheat, in a Cambic Arenosol with 5.9 g kg<sup>-1</sup> organic matter and 0.4 g kg<sup>-1</sup> N Kjeldahl. The experiment was conducted in pots, in a vegetation greenhouse, during approximately 4 months. The residues tested were municipal solid waste, poultry manure, secondary pulp mill sludge, dried solid phase from pig slurry, composted solid phase from pig slurry and horn meal. Amounts of residues corresponding to applications of 80 and 160 kg N Kjeldahl ha<sup>-1</sup> were mixed with the soil, that was supplemented or not with nitrogen mineral fertiliser ammonium nitrate. The application of residues to the soil increased wheat biomass production, as a consequence of the supply of higher amounts of N. The organic nitrogen contained in the municipal solid waste and in the pulp mill sludge appeared to be of more steady nature. Significant correlation between C/N ratio and residues mineralisation did not seem to occur.