Evaluation of Nitrogen Dynamics in Vineyards of Languedoc Roussillon

A Thesis Submitted to
the Global Environmental Science
Undergraduate Division in Partial Fulfillment
of the Requirements for the Degree of

Bachelor of Science

in

Global Environmental Science

September 2003

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ABSTRACT

A comparative analysis of soil nitrogen dynamics corresponding to different cultivation techniques (e.g. soil management) was conducted on vineyards in Languedoc Roussillon (Southern France). The technique of covering a vineyard with winter grass was compared to bare soil vineyard conditions in terms of N availability and vine N uptake. Winter grass cover is mainly used to reduce soil erosion during periods of high rainfall in Languedoc Roussillon. However this grass cover technique is not utilized in summer when grass and vines could compete for water. Therefore, grass is either cut or removed before the dry summer season. Soil nitrogen is expected to increase with grass cover management but this technique could involve significant N competition with the vines. In order to reduce N pollution of water systems in grape growing areas, a model for the dynamics of N in vineyard soils is essential. A prototype model for N soil dynamics is proposed here for various soil management techniques (e.g. soil cover, fertilization) and weather conditions. Although the model developed in this work indicates that grass cover reduces erosion in vineyard, N-content is higher in grass covered vineyards. Therefore, N losses with soil cover could be significant depending on grass N uptake efficiency.