

Nutrient release by decomposing ryegrass and white clover contributes to mineral nutrition of grapevines

Gustavo Brunetto^{*1}, Maurizio Ventura², Francesca Scandellari², Ilaria Filippetti², Carlos Alberto Ceretta¹, George Wellington Melo³, João Kaminski¹ and Massimo Tagliavini⁴

Address: ⁽¹⁾Department of Soils of the Federal University of Santa Maria, C. P. 221, Cep: 97105-900, Santa Maria (RS), Brazil. ⁽²⁾Department of Fruit and Woody Plant Sciences, University of Bologna, Viale Fanin, 46, 40127, Bologna, Italy. ⁽³⁾Embrapa Grape and Wine, C. P. 130, Cep: 95700-000, Livramento 515, Bento Gonçalves (RS), Brazil. ⁽⁴⁾Faculty of Natural Sciences and Technology, Free University of Bolzano/Bozen, Via Sernesi 1, 39100, Bolzano/Bozen, Italy.

Herbaceous crops grown in the vineyard alleys may represent a source of nutrients for grapevine. This study reports two experiments aimed at (1) understanding the decomposition and nutrient release by aerial organs of *Lolium perenne* (*LP*) and *Trifolium repens* (*TR*) and (2) characterizing the uptake of nitrogen (N) derived from decomposing material of *LP* and *TR* (N_{dfr}) by grapevines. *LP* and *TR* plants were labeled in pots with ammonium nitrate (¹⁵N at 10 % abundance, for a total of 10 g N m⁻²). *LP* and *TR* were cut and used to set two experiments both located at the experimental Station of the University of Bologna, Italy. In experiment 1, in April 2007, 2.04 g (DW) of N-labelled litter of *LP* and *TR* were placed into litter bags which were placed on the vineyard soil surface. Collection of bags *LP* and *TR* was performed 8 (June) and 16 (August) weeks from litter bags deposition. In experiment 2, 30 g plant⁻¹ of dry litter of *LP* and *TR* were placed on the herbicided soil under the grape plants. Leaves were collected 8 and 16 weeks from litter deposition; at 16 weeks, shoots including bunches were collected. Results show that the remaining of *LP* and *TR* residues was of 44.73 and 46.93% of DW at 8 weeks and 28.94 and 27.59% at 16 weeks, but the release of nutrients was different for *LP* and *TP* and varied according to the mineral element. Grapevines recovered similar amount N of *LP* and *TR* residues.

Keywords: *Vitis Vinifera*, cover crop, ¹⁵N, N recovery.

*Corresponding author: brunetto.gustavo@gmail.com