



## **Nitrogen soil mapping through crop growth, after application of wine-distillery waste compost in vulnerable zones.**

Raquel Villena Gordo (1), M. Carmen Cartagena (1,2), Maria Teresa Castellanos (1), Augusto Arce (1,2), Ana M. Tarquis (2,3)

(1) Dpto Química y Tecnología de Alimentos. ETSIAAB-UPM, (2) CEIGRAM, Universidad Politécnica de Madrid (UPM), Madrid, Spain., (3) Grupo de Sistemas Complejos, Universidad Politecnica de Madrid (UPM), Madrid, Spain

The winery industry in Mediterranean area is accompanied by the generation of big amounts of wastes from the wineries and distilleries. The recycling of these materials as source of organic matter and nutrients is a good option of management. The agricultural use of exhausted grape marc after composting is a good option in the circular economy context. Recently, there is a research line on the use of this waste as a contribution in nitrogen. However, the effect in the short and medium term depends both on the amount of waste applied and on the speed of mineralization of the organic nitrogen contained therein, which implies that it can be assimilated by the crops. Knowledge of the behavior of this process is important in vulnerable areas where a large amount of assimilable nitrogen already exists in the soil and in the irrigation water, with the environmental risk that this entails.

In this work, the contribution of nitrogen from three doses of pomace compost in two successive crops was evaluated over three years (2013-2015). The first crop was melon, cultivated under drip-irrigation and the second one was a rainfed cereal (wheat) as a reference. Relative entropy ( $E(\delta)$ ) parameter was used to investigate the residual effects of fertigation treatments applied to a previous crop (melon) on wheat and grain biomass. The wheat crop covered nine subplots from a previous experiment on melon responses to fertigation. Each subplot had previously received a different level of applied nitrogen ( $N_{app}$ ), and the plants from the previous melon crop had already taken up part of it. Many factors affect these variables, causing them to vary at different scales and creating a non-uniform distribution along a transect. Correlations between the two variables and  $N_{app}$  showed high volatility. A discussion on the utility of using a cover crop as a reference for the use of Nitrogen is exposed.

### References

Tarquis, A. M., Castellanos, M. T., Cartagena, M. C., Arce, A., Ribas, F., Cabello, M. J., de Herrera, J. L., and Bird, N. R. A.: Scale and space dependencies of soil nitrogen variability, *Nonlin. Processes Geophys.*, 24, 77-87, 2017.

### Acknowledgements

This project has been partially supported by INIA-RTA04-111-C3 and by the Ministerio de Economía y Competitividad (MINECO) under contract nos. MTM2015-63914-P and CICYT PCIN-2014-080.