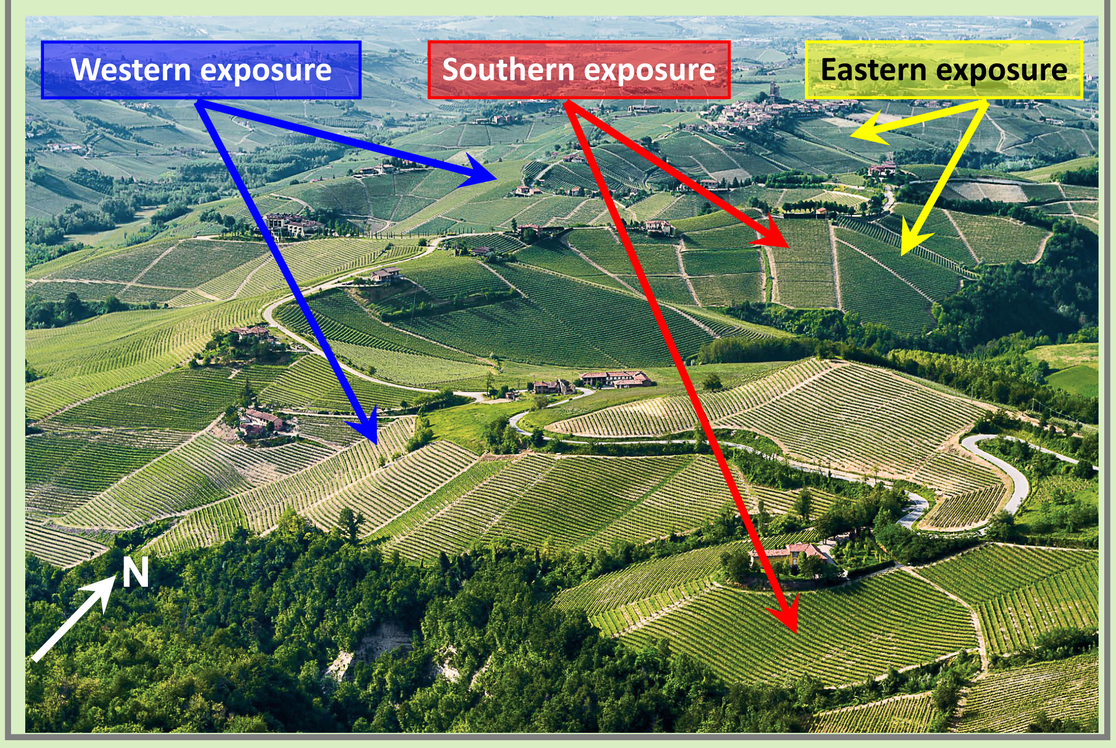
GEOGRAPHICAL FEATURES SUCH AS SLOPE AND EXPOSURE ARE TERROIR ELEMENTS INFLUENCING GRAPE QUALITY

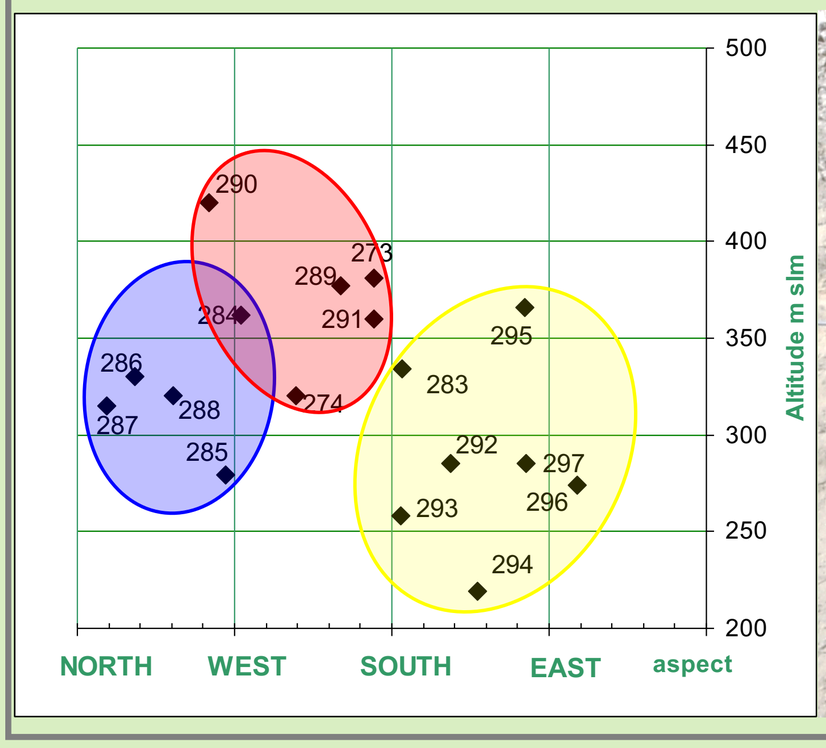
Elena Mania[1], Luca Gangemi[1], Mauro Piazzi[2], Emanuele Sapino[2], Silvia Guidoni[1*]

[1]Dipartimento Scienze Agrarie, Forestali e Alimentari (Università di Torino) Via L. da Vinci, 44 - 10095 Grugliasco, Italy
[2]Timesis, Via Niccolini 7 – 56017 San Giuliano terme (PI) Italy
**Corresponding author: Tel.+39 011 6708659, Email: silvia.guidoni@unito.it*

Landforms are natural physical features of the landscape. The hilly landscape of "**Barolo area**" (**north-west Italy**) is characterized by a **high geospatial heterogeneity** giving rise to different environments in term of the **elevation, slope** and **aspect.** Their synergic action may influence water flow, weather, intercepted **solar radiation** and **climate at meso scale level.**

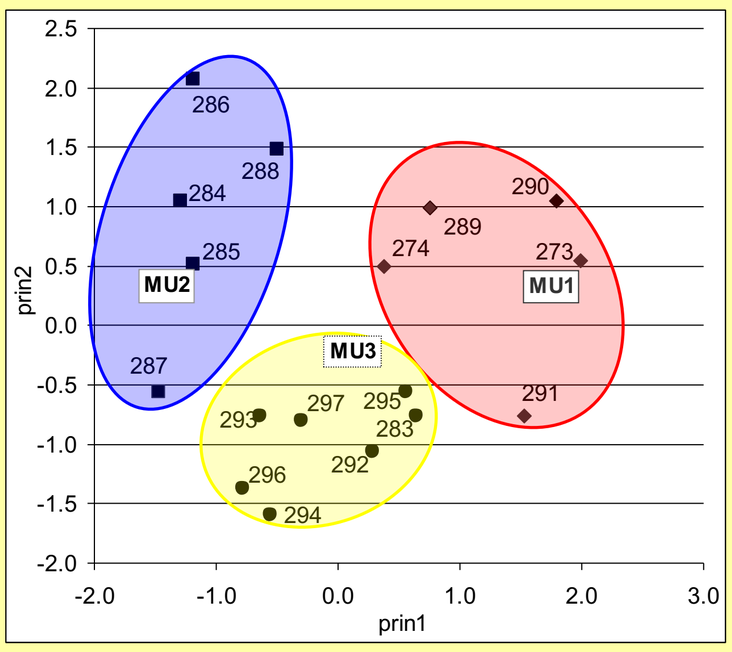


In Barolo area, vineyards cover almost all the cultivated surface and **Nebbiolo** is by far the most used variety. All the possible **exposure** and **altitude** range of the hilly system are represented in the studied vineyard set.



In similar areas, the influence of **geospatial variability** has to be analysed as a **terroir component**. Our hypothesis was that these characteristics could also influence **grape quality**.

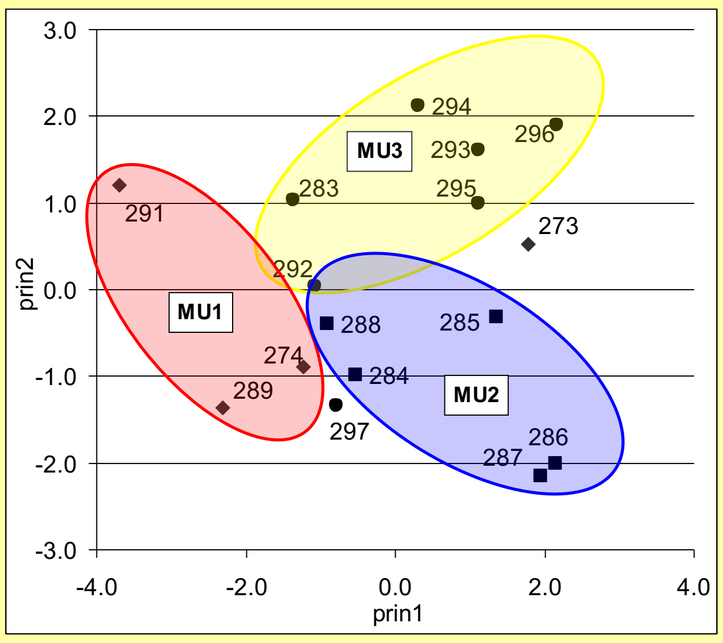
The **geographical features** of the vineyards, such as **slope, altitude, exposure** have been assessed and **intercepted surface solar radiation** has been estimate by using the tool "Area Solar Radiation" of ArcGIS Pro 2.1 software (ESRI, US). The main bioclimatic indexes related to the vine vegetative period were calculated using data from Regional Meteorological Station Network.



Distribution of the vineyards based on a PCA model considering the geographical features.

PCA classified the vineyards into 3 **geomorphological units (MU**) by means of "**incident solar radiation"** (correlated with Prin1) and **exposure** (correlated with Prin2). Vineyards belonging to MU1, MU2 and MU3 were averagely faced south, west and east, respectively.

The **grape ripening** has been monitored in **2012-2013** analysing: soluble solid content (Brix), titratable acidity (mg/L), pH, malic and tartaric acids (mg/L), potassium (mg/L), yeast available nitrogen (YAN) of the must and skin anthocyanin concentration (mg/L). The vine vigour and yield have been also assessed.



Distribution of the vineyards based on a PCA model considering the **2012** grape ripening variables.

Eastern vineyards (MU3) were more **vigorous**, had higher **yield** and lower **berry sugar** and **anthocyanins** concentrations than the others.

In **2012**, a warm and dry season, few differences between vineyard exposures emerged, whereas in **2013**, with wetter and cooler conditions, the eastern exposure (MU3) was more penalized in term of grape quality. In southern vineyards (MU1) quality remained more stable over the two years.

The **anthocyanins** were particularly sensitive to season and geographical features: in both years they achieved higher concentrations in western vineyards (MU2) than in the eastern ones (MU3).

Despite the potential of the vineyard **geomorphological traits** in determining grape quality, winegrower's choices may contribute to drive grape ripening. **Winegrowers' know-how** interacts with the environment footprint and plays a decisive role in refining vineyard quality potential. These results may lead winegrowers **to adapt their traditional practices** in order to improve the **vineyard resilience** in a **climate changing** scenario that, in the study area, become visible in a huge seasonal meteorological anomaly.

Mania E., M. Piazzi, L. Gangemi, A.E. Rossi, F. Cassi, S. Guidoni, *Proceeding XI Terroir Congress*, 316-320 (2016) - Mania E. *PhD Thesis* Università di Torino, 184 (2017) - Guidoni S., F. Petrella, M. Giovannozzi, *Tong* 16, 23-28 (2013) - Asproudi A., D. Borsa, E. Mania, L. Gangemi, S. Cavalletto, M. Dipalma, S. Guidoni, *Acta Italus Hortus*, 13, 51-52 (2014).