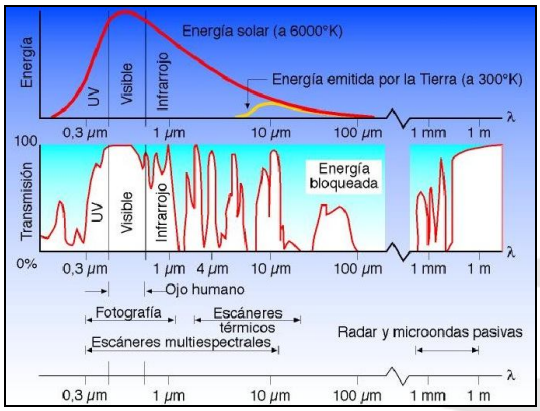
SM GEODIM
MODELOS DE INFORMACIÓN DE LA TIERRA

Products & Services

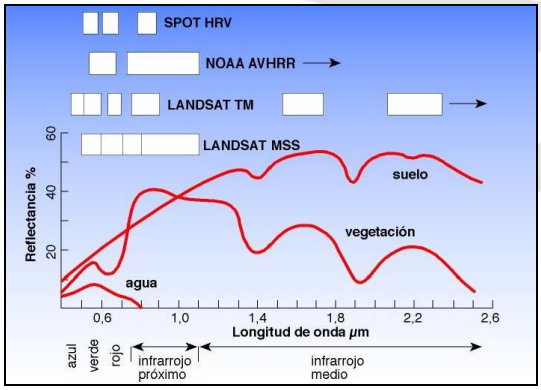
VINEYARD MANAGEMENT FROM SATELLITE

What is Remote Sensing?

Remote Sensing is the ability to obtain information from objects of the Earth's surface through the study of the electromagnetic radiation reflected or emitted by these objects.



The human eye is a sensor that captures electromagnetic radiation in the visible region, but it cannot catch other spectrum regions where vegetation and soils present a higher spectral response based on its characteristics and vegetative development.



These spectrum regions are captured by multispectral sensors on board of satellites and aircraft, allowing us to *see* vegetation characteristics, invisible to human eye.

These sensors encode the radiation in multispectral images that can be georeferenced (adapted to map projection) and analyzed with a GIS (*Geographical Information System*) to extract the desired information to improve the management of our crops.

Why using a satellite image for harvest?

Images record the vineyard interaction with electromagnetic radiation both in visible and near infrared regions.

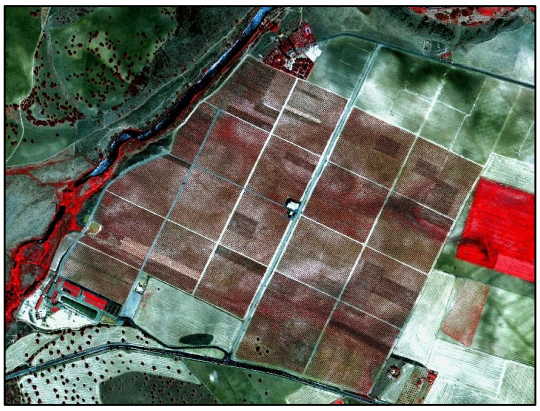
These interactions are related to the greenness of the plant, its photosynthetic activity and its biomass amount.

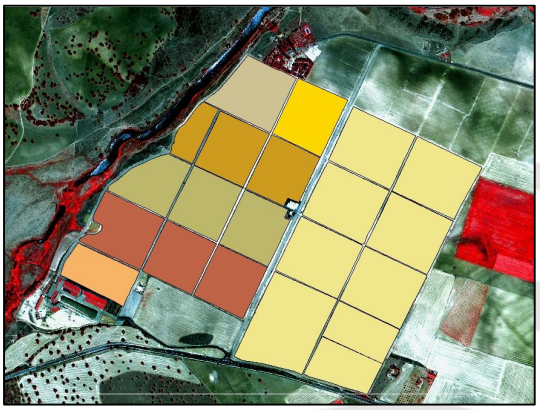
There is a direct relation between Vegetation Indexes that can be obtained from multispectral images and vineyard Leaf Area Index (*LAI*) estimated in the field.

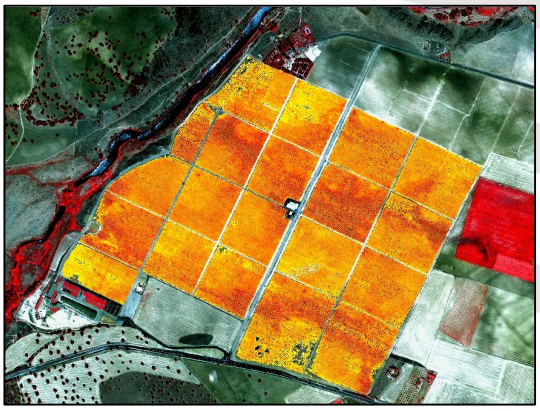
These Vegetation Indexes are used to segment vineyard exploitations into homogeneous areas, from vegetation vigour point of view, and it has been shown that this segmentation is useful to maximize the production of quality wines.

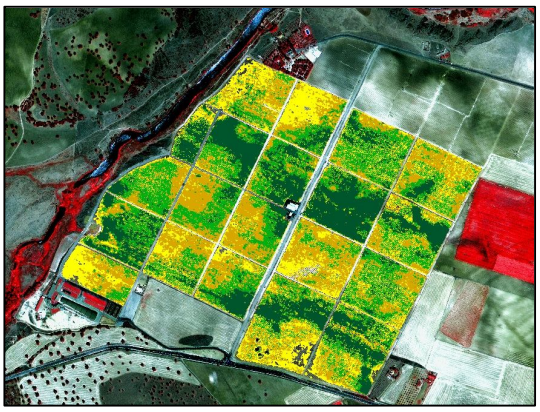
Several studies, in France from the ICV *(Institut Coopératif du Vin)* and in Spain from *Verdtech Nuevo Campo*, have shown a correlation between values of Vegetation Indexes calculated from a satellite image and the quality of grape-juice.

These correlations are obtained for each vineyard exploitation by the integration with other parameters such as the load of grapes.









How to improve my quality with pre-harvest satellite images?

Satellite images allow a stratification of our exploitation into homogeneous classes.

Through field surveys it is possible to identify which class is giving the best quality for our different varieties.

These grape quality samplings before harvest are performed only for each class in which the exploitation is zoned.

This way, we can make a selective harvest attending to quality values assigned to each zone, harvesting them separately and realizing an independent winemaking.

These images also facilitate the design of improvements plans, in winter, through cultural actions that allow the homogenization of the exploitation, leading the areas of lower quality towards the values of highest quality areas.

A satellite image allows us to obtain multispectral information of all the exploitation's plants. That is, continuous information along space, however, it only gives us information in the image acquisition moment.

To characterize the vegetation growth is convenient to combine this continuous information in space with continuous-time information provided by plant-soil sensors.

In the figures, it is possible to see some of the products generated from satellite images: i) infrared images for vineyard exploitation, ii) mapping of existing grape varieties in the exploitation, iii) Vegetation Index obtained from satellite images and iv) exploitation zoning according greenness, photosynthetic activity and vegetation cover.

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LA GESTIÓN DE VIÑA DESDE SATÉLITE v. 2013