The development and changes of vineyard monitoring with remote sensing in Ningxia

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Abstract:

With the unique terroir, the region in the east hillside of Helan mountain in Ningxia is well recognized one of golden regions in the world for the cultivation of wine grape and the production of high quality wine, and thereafter this region was designated the protection area of national product of geographical indication in 2002. With the strong policy support, the vineyard develops very fast on the Gobi desert in recent years and the land use has changed obviously. This objective of this study is to monitor the evolution and changes of vineyard in the region with the Landsat8 data since 2013 and provide the scientific information for the decision maker of the vineyard management. Landsat8 data were downloaded from the USGS official website and formed the time series dataset after several step fine processes. The ground truth data were collected during 2016 to 2018. Based on the ground truth data in 2016 to 2018, with the reference map of high resolution of GOOGLE EARTH, the training samples for 2013 to 2015 were further obtained. The random forest was used as the classifier to have satellite images of each year classified. The results were validated with the error matrix and further verified with the field boundary data that was drawn by another group of researchers. The evolution and changes of the vineyard was further analyzed based on the validated results of vineyard map.

Key words: vineyard, Crop Classification; Ningxia; Dragon Program