

Monitoring of Cannabis Cultivation with High-Resolution Images

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Abstract : Cannabis is mostly used for drug production. In some countries, an excessive amount of illegal cannabis is cultivated and sold. Most of the illegal cannabis cultivation occurs on the lands far from settlements. In farmlands, it is cultivated with other crops. In this method, cannabis is surrounded by tall plants like corn and sunflower. It is also cultivated with tall crops as the mixed culture. The common method of the determination of the illegal cultivation areas is to investigate the information obtained from people. This method is not sufficient for the determination of illegal cultivation in remote areas. For this reason, more effective methods are needed for the determination of illegal cultivation. Remote Sensing is one of the most important technologies to monitor the plant growth on the land. The aim of this study is to monitor cannabis cultivation area using satellite imagery. The main purpose of this study was to develop an applicable method for monitoring the cannabis cultivation. For this purpose, cannabis was grown as single or surrounded by the corn and sunflower in plots. The morphological characteristics of cannabis were recorded two times per month during the vegetation period. The spectral signature library was created with the spectroradiometer. The parcels were monitored with high-resolution satellite imagery. With the processing of satellite imagery, the cultivation areas of cannabis were classified. To separate the Cannabis plots from the other plants, the multiresolution segmentation algorithm was found to be the most successful for classification. WorldView Improved Vegetative Index (WV-VI) classification was the most accurate method for monitoring the plant density. As a result, an object-based classification method and vegetation indices were sufficient for monitoring the cannabis cultivation in multi-temporal Earthwiev images.

Keywords : Cannabis, drug, remote sensing, object-based classification

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