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Monitoring seasonal progress of rice stubble burning in major rice growing districts of Haryana, India, using multidate AWiFS data

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Abstract. The present paper describes the methodology and results of assessment of seasonal progress of rice stubble burning for 10 major rice growing districts of Haryana state in India. These 10 districts contribute about 84 per cent of total rice area of the state. As the rice fields are immediately required to be vacated for the sowing of next crop the farmers opt for mechanized harvesting and easy way out of burning the stubbles in the field. Such burning result in release of polluting gases and aerosols. Besides, the heating of the soil kills the useful micro-flora of the soil causing soil degradation. Multi-date AWiFS data from Resourcesat 1 and 2 satellites acquired between October 16, 2013 to November 26, 2013 were used for estimating paddy stubble burning areas at different intervals for the year 2013 crop growing season. In season collected ground truth data using hand held GPS along with field photographs were used to identify paddy stubble burning areas and other land features. Complete enumeration approach and Iterative Self-organizing Data Analysis Technique (ISODATA) unsupervised classifier was used for digital analysis. Normalized Difference Vegetation Index (NDVI) of each date was also used with other spectral bands of temporal images. To improve the classification accuracy the non-agricultural areas were masked out. The area was estimated by computing pixels under the classified image mask. Progress of paddy stubble burning was estimated at different intervals for the year 2013 using available cloud free multi-date IRS-P6 AWiFS data to identify the crucial period when stubbles burning takes place in major area so that preventive measures can be taken to curb the menace.