

ABSTRACT

RASAT was launched on August 17, 2011 from Russia and still continues its mission successfully. By its 1400th day in orbit, RASAT had provided imagery covering approximately 8.000.000 square kilometers from all over the world. After the launch of the RASAT, remote sensing research at TÜBİTAK UZAY has gained importance. Many projects have been initiated.

In this poster, a short survey of remote sensing research at TÜBİTAK UZAY is presented. One of the projects is GeoPortal: The goal of this project is to enable the easy access to satellite images obtained from RASAT.

More specifically, the radiometric and geometric calibration of images, generation of an image mosaic encompassing all Turkey, and servicing of all images via an open-source coded GEZGİN GeoPortal are planned. GEZGİN (www.gezgin.gov.tr) provides access of RASAT satellite images to authorized stakeholders.

Research and development activities related to hyperspectral imagery can be grouped about two main thrusts at TÜBİTAK UZAY. The first one is the design and manufacture of a spaceborne hyperspectral camera. The second one is hyperspectral remote sensing applications. The main topics studied at TÜBİTAK UZAY include basic corrections such as radiometric and geometric correction, and including smile and keystone corrections, denoising, de-stripping, dimensionality reduction, target and anomaly detection and classification. Ongoing and upcoming hyperspectral remote sensing projects tackle similar problems with an emphasis on crop monitoring and classification for precision agriculture.

TÜBİTAK UZAY is also a partner in GEO-CRADLE «Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East and Balkans and Developing Links with GEO related initiatives towards GEOS», H2020 project. GEO-CRADLE brings together key players representing the Region of Interest (Balkans, N. Africa and M. East) and the complete EO value chain therein, with the overarching objective of establishing a multi-regional coordination network. TÜBİTAK UZAY will lead tasks about Turkey for GEO-CRADLE project.

Keywords—Remote Sensing, Earth Observation, RASAT, hyperspectral image processing, precision agriculture, disaster management, GEO-CRADLE project.



GEO-CRADLE
Coordinating and integRating state-of-the-art Earth Observation Activities

The GEO-CRADLE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 690133.

<http://www.geocradle.eu/>

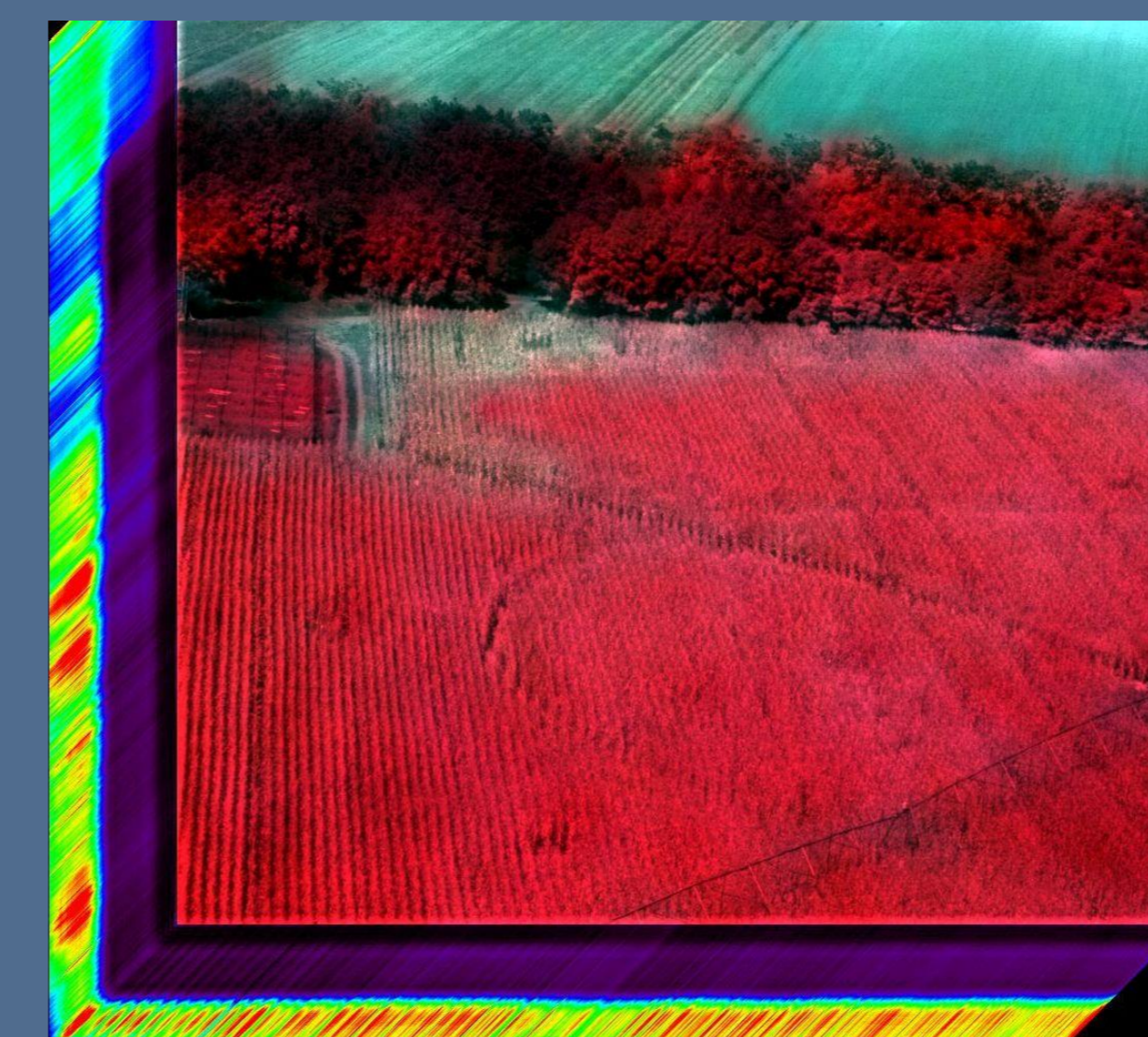
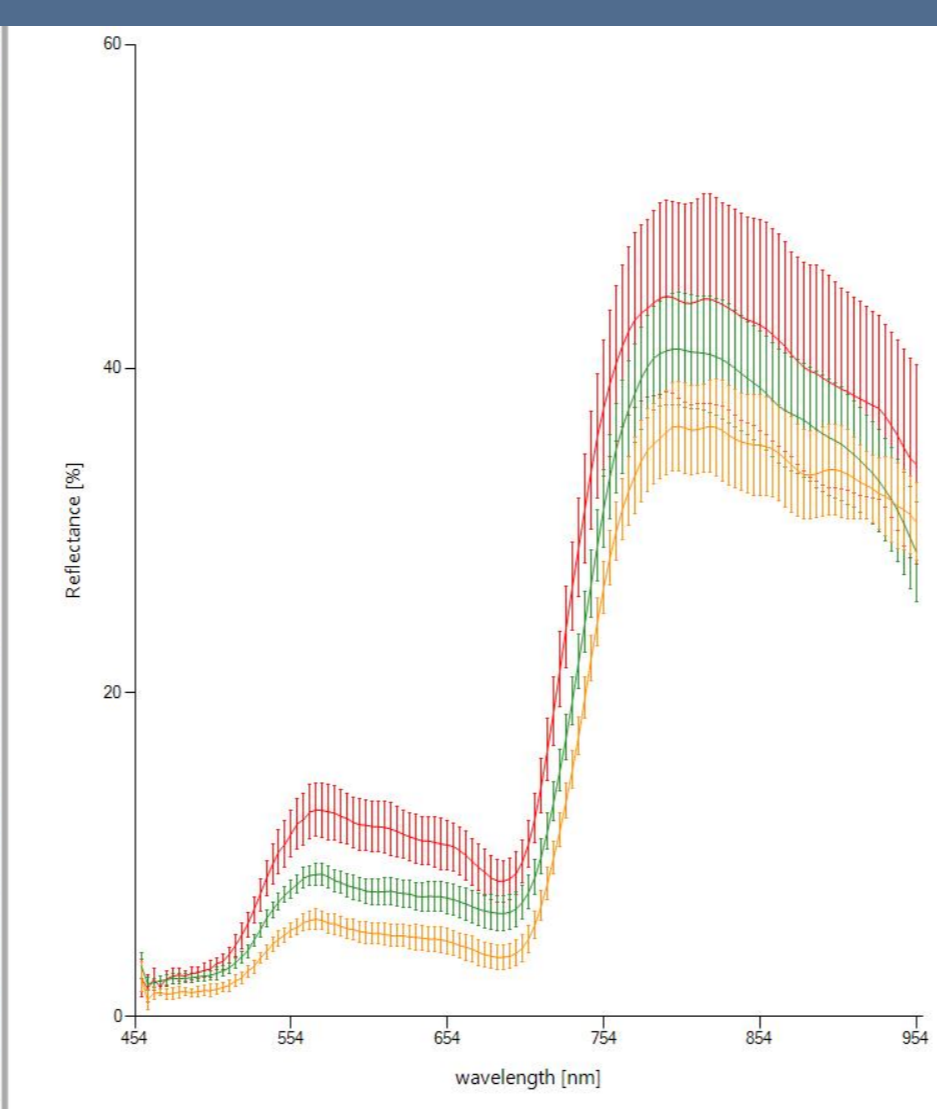
SMART AGRICULTURE FEASIBILITY PROJECT (AKTAR)



Smart agriculture aims to develop models for irrigation, fertilization and spectral signatures of crops in Inner Anatolia. Wheat, barley, rye, oat, apple, sour cherry and cherry will be analyzed. Available land for the project is up to 400ha, while around 100 ha is expected to be used for experiments. Ground measurements include soil moisture, spectral signature, and meteorological data. There will be controlled test areas for fertilization and irrigation. At the end of the project precision agriculture practices to control irrigation, fertilization, pesticide and estimation of crop yield will be developed.



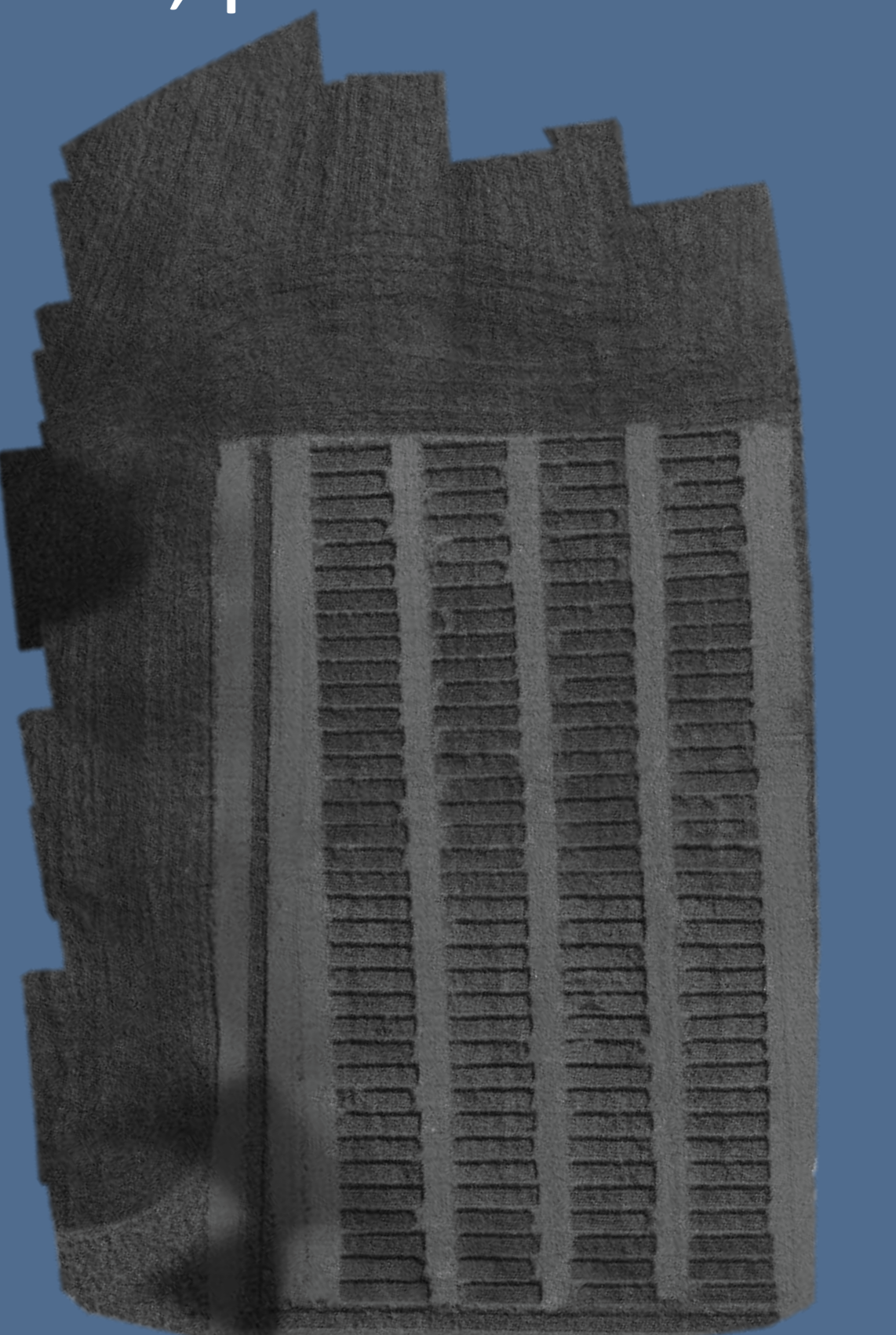
Sunflower, Soybean and sugar beet fields are images at 100 meters with a hyperspectral camera, red, green and orange are their respective spectras.



NIR False Color data cube of center pivot corn crop



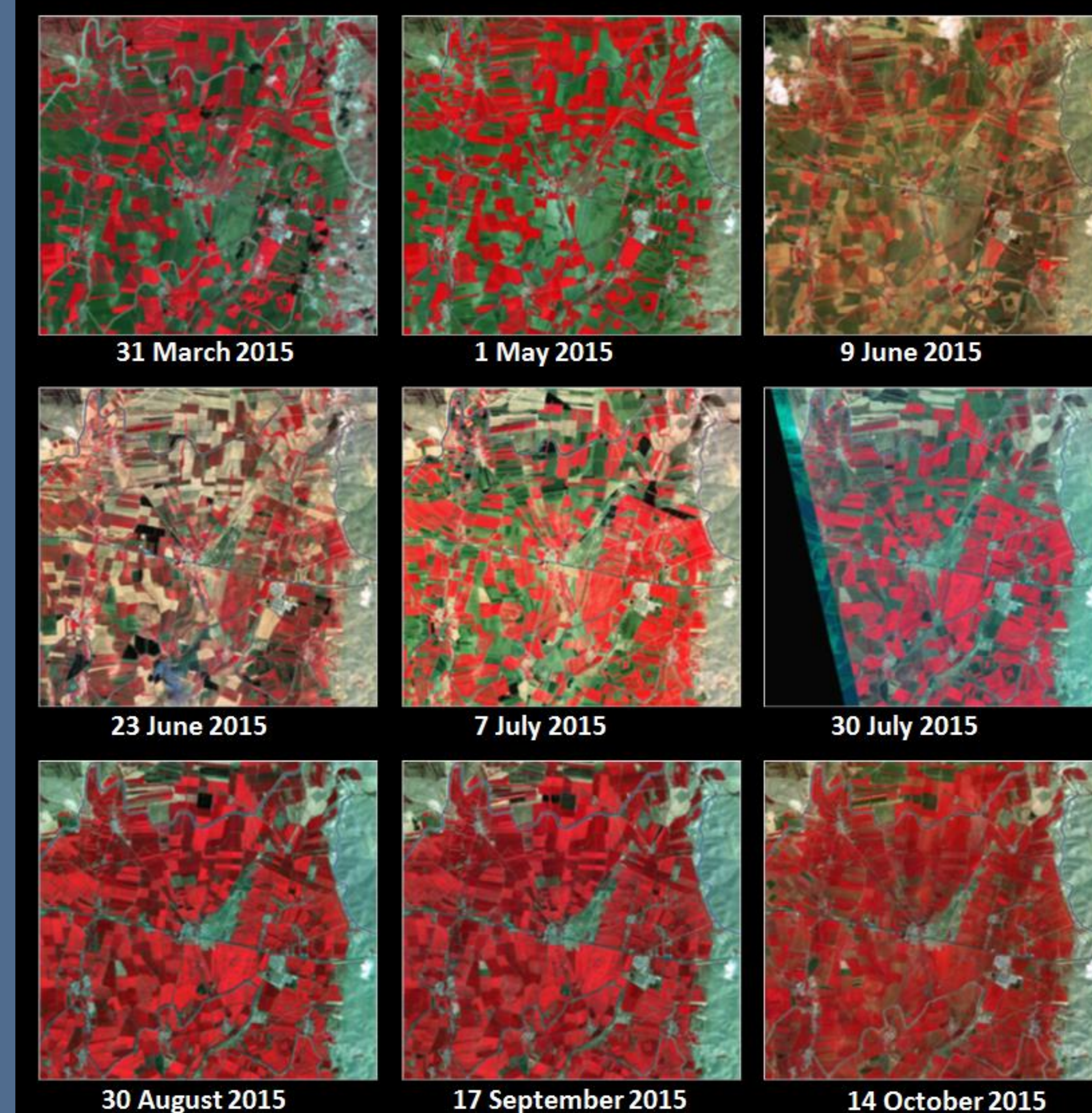
Drone waypoint planning



Wheat fields of the mosaic image

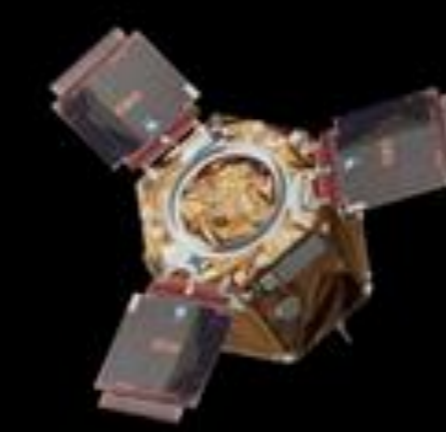
HASSAS - WIDESPREAD APPLICATION OF SUSTAINABLE PRECISION AGRICULTURE PRACTICES IN SOUTHEASTERN ANATOLIA PROJECT REGION (GAP)

Göktürk-2



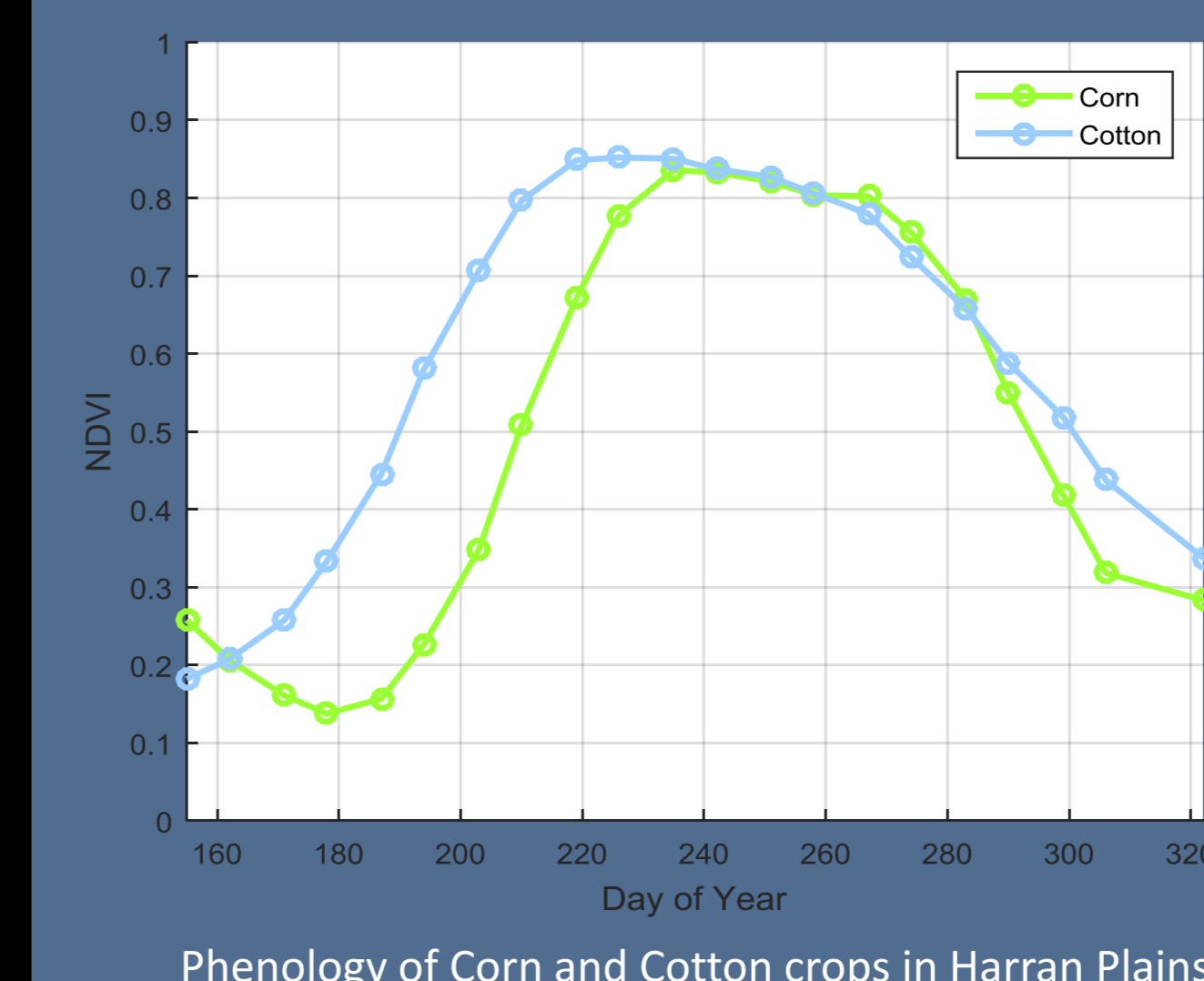
Şanlıurfa Agricultural Areas

NIR Red Green Bands



This project aims to study development of precision agriculture practice in GAP region. Multi-spectral satellite imagery and aerial hyperspectral data along with ground measurements will be collected to analyze data in an information system. Project will study feasibility of precision agriculture application in a pilot area.

In project scope, wheat, corn and cotton products grown in GAP region will be analyzed by using aerial hyperspectral data, satellite imagery along with ground measurements. As the result of analyzes, the precision agriculture practice such as disinfection, irrigation, fertilization will be developed. By this means, it will be able to provide increased efficiency by using less input (water, fertilizer and pesticide) in the same agricultural land.



Phenology of Corn and Cotton crops in Harran Plains



Göktürk-2 Satellite image true color and false color from Çamlıdere village, Şanlıurfa Turkey, 09.06.2015.