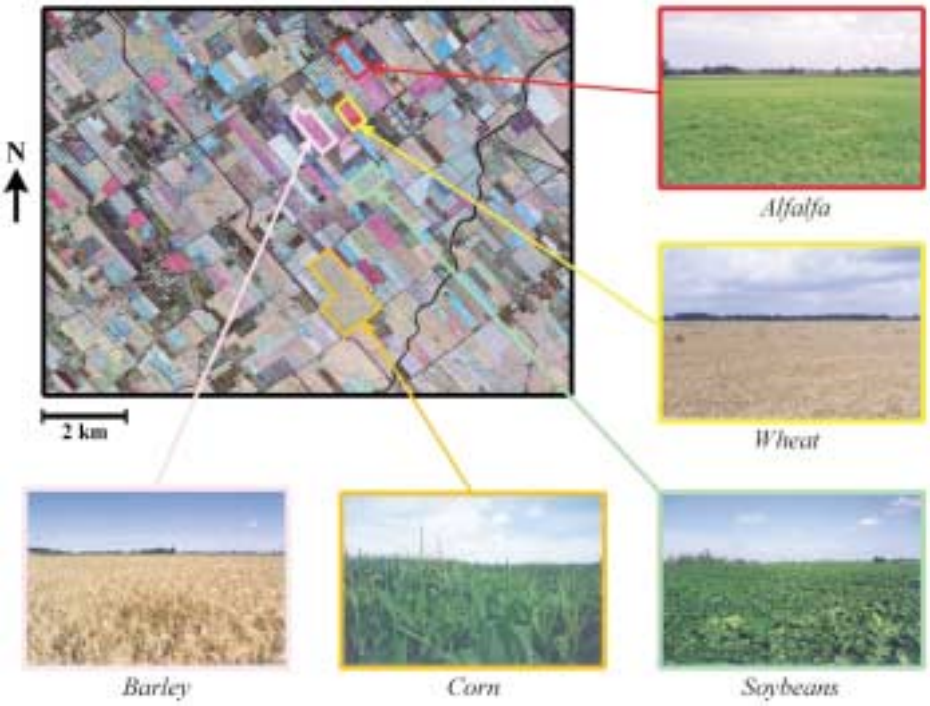
Canadian Space Agency | Agence spatiale canadienne

RADARSAT-2
Enhanced agriculture monitoring

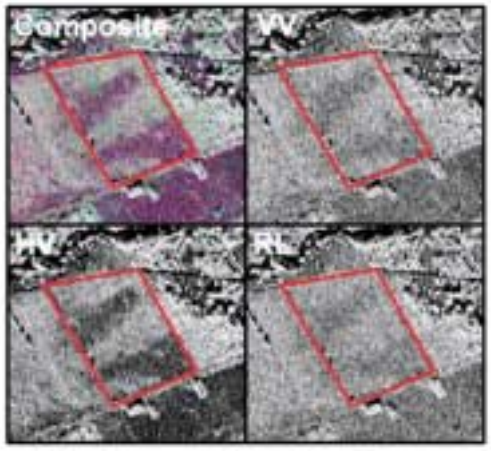
MONITORING AGRICULTURE WORLDWIDE

Effective management of agricultural resources and the preparation of accurate estimates on crop production are essential in ensuring that the agri-business market is positioned to meet the demands imposed by the global population. The usefulness of remote sensing data in monitoring agricultural resources, through vegetation parameters and soil conditions, has been demonstrated by both optical and radar satellite systems.

RADARSAT-2 with its Synthetic Aperture Radar (SAR) is an ideal sensor for agricultural applications. Due to persistent and frequent cloud cover during the growing season in some regions, SAR sensors are often the only available source of remote sensing data. Experience with previous spaceborne sensors, such as RADARSAT-1, showed that imaging radars provide unique information on crop structure and moisture content. The radar signal is also sensitive to underlying soil conditions when the vegetation cover is low.



Agricultural fields, South of Ottawa, Canada. Linear polarizations composite: red-HH, green-HV, blue-VV. (© CCRS 1998. Acquired by CCRS CV-580 C-band SAR. Processed and provided by CCRS)



CV-580 images of soybeans field, South of Ottawa, Canada. (© CCRS 1998. Acquired by CCRS CV-580 C-band SAR. Processed and provided by CCRS)

MULTI-POLARIZATION AND HIGH-RESOLUTION DATA

The enhanced capabilities of RADARSAT-2, such as multi-polarization and improved spatial resolution, will generate more accurate data on crop identification, crop damage assessment, crop residue coverage, tillage practice and soil moisture content.

Polarization diversity provides more complete information on crop structure. Co-polarized signals (VV and HH) are sensitive to crop geometry and cross-polarized signals (HV or VH), which result from volume scattering within the canopy, show high sensitivity to variations in crop structure and moisture. HH signals at low incidence angles can penetrate vegetation and can provide, to some extent, information on soil moisture. These are valuable inputs to precision farming techniques.

RADARSAT-2 will be able to acquire data with resolutions ranging from 3 meters using Ultra-Fine mode to 100 meters using ScanSAR mode. Very high-resolution data are particularly useful for small crop parcels monitoring and for field variability studies. In many parts of Asia and Europe, where field sizes are small, the ability to produce high-resolution images will allow these markets to benefit from the advanced capabilities provided by RADARSAT-2.

RADARSAT-2 Programme
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