

Satellite Radar Assessment of Winter Cover Types

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SUMMARY. Irrigated soils in the Columbia Basin of eastern Washington are susceptible to wind erosion and nitrate leaching when left bare during the winter months. Producers are encouraged to incorporate cover crops into their rotations or leave crop residues on their fields over winter to minimize erosion. Actively growing vegetative cover is required to trap nitrate and prevent it from leaching. Although some growers have adopted these practices, it is difficult to estimate the total land area under cover during the winter months. Satellite radar imagery may be a tool for monitoring the adoption of the above-mentioned practices. Our objective is to determine the feasibility of discriminating among cover types using satellite radar imagery. During the winter of 1999-2000, three RADARSAT-1 images of this area were obtained. Ground data was collected on or near each date of data acquisition. Three distinct groups were separated from one another through statistical analysis and unsupervised classifications: 1) smooth bare fields and fields with sparse, dried residue, 2) smooth fields which contain sparse green vegetation, and 3) fields with heavy vegetation, either alive or dead; or rough bare fields. Variation in brightness within group 1 was correlated with soil moisture while the variation within group 2 was more a function of plant water in the canopy. Optical data may be required to aid in the identification of nitrogen scavenging crops, since actively growing vegetation is difficult to discern from fields with heavy residue or rough, bare surface conditions.