



Controlling Weeds— Saving Farmland— Boosting the Agricultural Industry

CMC Microsystems is helping researchers to design new tools that will help to protect agricultural land from the ravages of leafy spurge and other weeds

“This technology offers tremendous potential for many applications—from remote sensing of the environment to the identification of counterfeit money or art. It could even be used to increase security in airports, by scanning the retina of the eye to accurately identify passengers.”

Mr. Peter Davis-Imhof
Research Manager
University of Lethbridge



Researchers at the University of Lethbridge are working with technologies provided by CMC Microsystems to develop an imaging system that can monitor the spread of leafy spurge. Left to right: Mr. Peter Davis-Imhof, Dr. David Naylor and Richard Querel.

Leafy spurge infests more than 2.7 million acres of land per year in southern Canada and the northern United States. In Manitoba alone, the rate of infestation has reached alarming levels, costing the provincial government about \$19 million annually.

Research enabled by CMC Microsystems could help to combat this growing threat to the agricultural industry.



Leafy spurge contaminates grazing areas, contributes to a loss of plant diversity and wildlife habitat, and significantly reduces the value of the land. The level of infestation has become a serious concern in Manitoba.

Dr. David Naylor and Mr. Peter Davis-Imhof of the Physics Department at the University of Lethbridge are working together with Agriculture and Agri-Food Canada (AAFC) on the development of a new type of imaging system that could be used to monitor the spread of leafy spurge over large geographical areas. This imaging Fourier Transform Spectrometer (FTS) could be installed in airplanes to enable the assessment of leafy spurge growth and the resulting damage to the land.

CMC is providing the team with field-programmable gate array (FPGA) technology, helping to reduce the time required for development as well as the cost of production.

“Dr. Rob Bouchier of AAFC requires a cost-effective and efficient technology that could eventually be turned into an airborne system. Today, the monitoring of leafy-splurge is very labour-intensive work. It requires many people to walk through fields and count plants. It would be far more efficient to take a hyper-spectral image of an area to acquire a broad overview of the abundance of leafy spurge,” says Mr. Davis-Imhof.

The team is aiming to develop a compact FTS system with enough computing power to process thousands of very high-resolution spectral images, and then turn the raw data into useful information that can help researchers on the ground.

“This is really an untapped area of remote sensing. Hyper-spectral imaging with FTS systems has barely been explored by the research community,” says Mr. Davis-Imhof. “Having access to the FPGA technology provided by CMC was critical when we started working with thousands of spectra at a time. We could otherwise never afford this equipment.” *cmc*