

## Can Infrared Aerial Photos Cut Losses for Potato Producers?

A study of the usefulness of aerial infrared photography shows that it can help potato producers make management and storage decisions about their crops, but it doesn't do away with the need for hands-on inspection of crops.

"The biggest take home from this is the idea that the photo can tell you where there's vigour and where there's not much vigour," says Tom Gonsalves, a business development specialist focusing on potatoes at the Manitoba Agriculture, Food and Rural Initiatives Carman Crops Knowledge Centre. "It won't tell you how good your yield is or your quality."

The Keystone Vegetable Producers Association sponsored the research and demonstration project in 2005, using IR photography on 15 Manitoba potato fields.

Researchers, led by Dr. Tracy Shinnars-Carnelley of MAFRI, selected fields in the Carberry, Portage La Prairie, Winkler and Selkirk areas. Aerial photos were taken in the summer, then surveyed from the ground prior to harvest. Yield, quality and rot data were then collected from strips in the photographed fields.

Photos of the fields indicate sometimes-dramatic differences in the health of the potato crops.

Some of the fields were seriously affected by heavy rain, notes Gonsalves.

In IR photos of fields that suffered the most, sections where potato plants were doing poorly because of the amount of moisture in the soil show up as green. Healthier potato crops appear as pink and the most vigorous areas are red.

Examining the fields prior to harvest and assessing the yield and quality indicated big differences. In one example, green areas produced a little more than one tenth the yield of the red areas, and substantially poorer quality potatoes.

Throughout the study 80 per cent of the green areas had a lower marketable yield and poorer fry colour than red-coloured areas.

In fields that had not been flooded, IR photography still revealed differences in the yield and vigour potato crops. In one example, the IR photo showed where a line of poorer-quality soil ran across a field of otherwise good growing land. It showed up in IR photos as a yellow-green line across a pink and red background.

In some cases, early detection of crop damage may allow a producer to take action to protect a crop. In other cases, a producer might be able to find out earlier that portions of a crop are irreparably harmed, destroy that the crop in that portion of the field and save unnecessary applications of pesticides. As well, reducing the number of poor quality potatoes going into storage reduces the amount of storage loss.

However, says Gonsalves, applying the insights gained from IR photography is not easy.

"The question is, 'is IR going to be a valuable tool for producers? Can that producer get value from that picture for the money?'"

Part of the challenge of using the information from the IR photos is the nature of the potato crop. Potatoes are a row crop and the variations in soil and moisture within a field do not always run in straight lines parallel to the rows.

As well, IR photography is no substitute for first-hand inspection. IR photography would be best used in combination with hands-on assessments of plant health in the field.

"You need to use it like a map and go out and dig some potatoes, do some evaluation and confirm that the potatoes are like that."

The project received funding from MAFRI's Covering New Ground initiative which supports demonstration projects aimed at environmentally sustainable agriculture.