

## Infrared Hotspot Prototype Construction, Testing and Evaluation

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### Background

The Alberta Agriculture and Forestry (AAF) infrared (IR) program stipulates that all potential IR contractors be tested and certified prior to being awarded a scanning contract. IR testing is performed at the AAF Scanning Grid located just outside Hinton, Alberta (Figure 1).

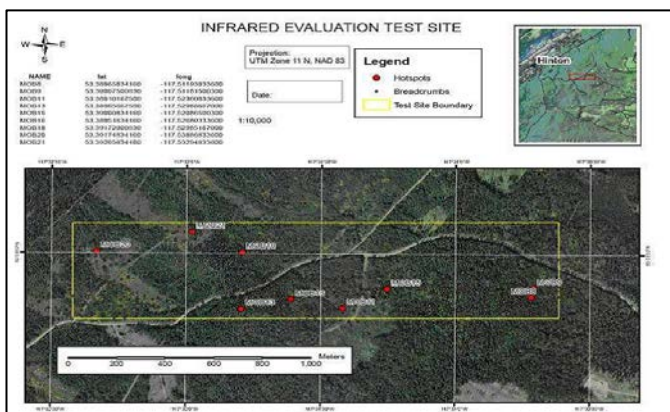


Figure 1. AAF IR Scanning Grid; Hinton, Alberta

Figure 2. Charcoal briquette (left) and open-flame propane burner (right) targets

Information regarding the Hinton Scanning Grid is available at the following link:

[wildfire.fpinnovations.ca/Research/ProjectPage.aspx?ProjectNo=50](http://wildfire.fpinnovations.ca/Research/ProjectPage.aspx?ProjectNo=50)

Simulated hotspot targets are strategically placed within the scanning grid to facilitate service provider testing. Previous hotspot targets have included charcoal briquettes and open-flame propane burners (Figure 2), which both have the potential to ignite surrounding forest fuels. The use of these hotspot targets require the presence of firefighting crews to transport the cumbersome hotspot targets and guard against potential wildfire ignition.

In response to these concerns, the AAF Wildfire Management Branch Geomatics Section proposed that FPInnovations coordinate the development of a new hotspot prototype that met the following criteria:

1. The prototype must reduce ignition potential to surrounding forest fuels.
2. The prototype must be smaller and easier to transport and handle in the field.

## Methods

Initial hotspot prototype design was completed by University of Alberta, mechanical engineering students in 2014. Details on the 2014 designs can be found at:

[wildfire.fpinnovations.ca/Research/ProjectPage.aspx?ProjectNo=157](http://wildfire.fpinnovations.ca/Research/ProjectPage.aspx?ProjectNo=157).

Decisions to have FPInnovations proceed with prototype construction, testing, and evaluations were reached in 2016. Project parameters were developed by FPInnovations and Alberta's Geomatics Section IR program staff. Myac Consulting Inc. was contracted to build and test the new prototype in the spring of 2017.

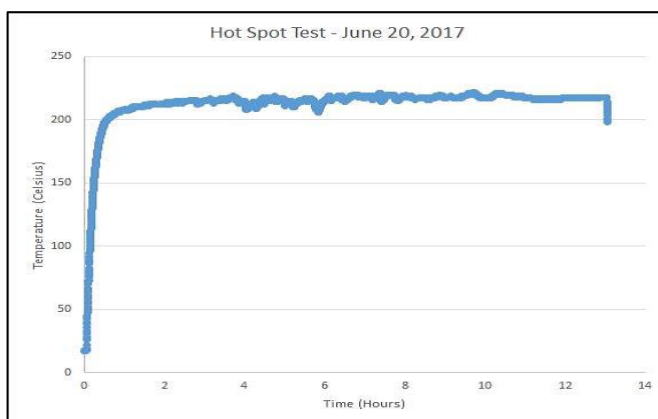
## Prototype hotspot design and evaluation

The hotspot prototype consists of a small metal box, an enclosed propane-fueled burner, a protective cage, a standard barbecue igniter, and an on/off switch. A standard propane hose and regulator is used to attach the disposable 1 lb. propane bottle, which is used to fuel the burner (Figure 3). Both the flame height and temperature are adjustable.

Initial bench testing was completed by Myac Consulting Inc. during prototype assembly and a demonstration was provided to AFF staff in the spring of 2017. The AAF Geomatics Section provided further field testing throughout the summer of 2017 and approved both its design and functionality.



**Figure 3. Prototype Hotspot Target**



**Figure 4. Prototype Hotspot target heat sustaining evaluation**

The use of a built-in igniter, the protective cage, and the fact that the flame is sealed within the unit reduced the risk of wildfire ignition compared to the charcoal briquettes and open-flame propane burner targets. The prototype target is capable of reaching and sustaining a target temperature of 200°C (Figure 4). The prototype is capable of a 16-hour operational period using a single 1 lb. propane bottle.

## Conclusion

The development of this new IR hotspot target improved target handling and decreased risk of accidental wildfire ignition. It also allows for more IR testing opportunities under higher fire hazard conditions than the previous models. Based on the success of this project, 30 targets will be produced and deployed at the IR Grid in Hinton in 2018.

## Acknowledgments

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