

Herbicide Spray on Cheatgrass (*Bromus tectorum*) For Soil Water Conservation

Background:

During a dry year, any conservation of moisture to stimulate crop growth is important. Limiting wheat yield potential and enhancing weed development, dry conditions complicate management strategies. Weeds also use available soil moisture at the expense of crop yields. Land managers must decide when the best time to spray the weeds is, or whether it would even be worth the cost to spray at all.



Figure 1. April 5, 2002 line between “control”-unsprayed (on the left) and late-sprayed parts of the field.

A Montana farmer wanted to know if water used by the weed cheatgrass during the winter was having a negative impact on his wheat yield. As an experiment, his field (Figure 1) was sprayed in late fall with glyphosate (Roundup). As a control, a 60ft. wide section of the field was not sprayed. The entire field, including the strip, was sprayed again prior to seeding in the spring.

Use of Data:

Imagery was used to monitor the fall herbicide application of cheatgrass. The 60 ft. unsprayed streak appears on the July 7, 2002, IKONOS-derived NDVI image (left image, Fig. 2) as well as the false color composite image (right image). The unsprayed area is still visible, showing the ineffectiveness of the spring glyphosate application. This illustrates that under dry soil conditions cheatgrass uses enough water during the dry fall and winter to permanently affect wheat production. To increase efficiency, the wheat-on-wheat stubble should be sprayed in the fall to limit as much as possible any cheatgrass invasion. The IKONOS imagery was particularly helpful for the farmer, from both a timing and spatial resolution perspective.

Economic and Environmental Benefits:

The result of this experiment convinced the farmer that fall spraying of his wheat stubble can conserve valuable soil moisture, because it eliminates weeds that would normally take up water. The differences shown in the imagery are clear and helped him make permanent decisions about weed management in general.

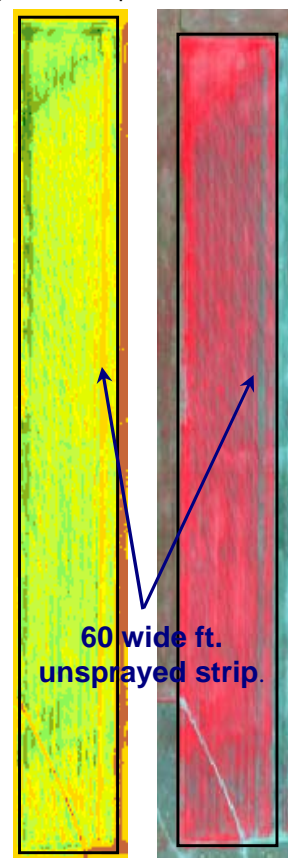


Figure 2. IKONOS July 7, 2002 Left, NDVI – Right, NIR/R/G. The 60 ft. unsprayed streak appears clearly on the right side of the field. (© Space Imaging)

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