

Predicting livestock performance with satellite imagery while targeting cheatgrass

AT A GLANCE

Cheatgrass suppression with livestock grazing can be quite effective during late fall but livestock performance can decline. Satellite imagery can help predict when to feed nutritional supplements.

The Situation

As cheatgrass increases to 15% or greater plant cover in the plant community, flammability increases and more wildfires occur. Grazing cheatgrass-invaded plant communities during late fall helps reduce new seedling recruitment as well as breaking down plant litter that aids in plant seedling survival. Yet, livestock performance declines as plant crude protein and digestibility decrease below maintenance requirements needed for optimal livestock production. Knowing when to provide protein supplements is important.

Our Response

With funding provided by the U.S. Forest Service (USFS) we were able to conduct a research project near Malad City, Idaho from 2021 to 2022. Our aim has been to integrate this research into Extension education and land management. This 2,500-acre USFS grazing allotment has a 24% infestation of invasive annual grasses and is in the “defend the core” part of the “Idaho Cheatgrass Challenge” targeted for increased management.

The grazing allotment was grazed by 400 cows in 2021 and 316 cows in 2022 from Oct. 25 to Nov. 22 (2021) or 19 (2022). There were 35 cows in each year that



Spring Hills allotment near Malad City site of 2021-22 targeted grazing project.

were outfitted with grazing collars to determine grazing behavior as well as livestock performance. Except for salt, no nutritional supplements were provided to these cattle. In 2021, late fall rainstorms before freezing weather resulted in significant green-up of forage. In 2022, drier and colder weather prevailed (Figure 2). The satellite imagery for these two very different years explains the differences we discovered for both grazing behavior and livestock performance.

Program Outcomes

We have presented this research to audiences at five locations and two webinars in Idaho and one location in Oregon. A poster was presented at the 2024 Society for Range Management Annual Meeting in Sparks,

Nevada. This was published in *Rangelands* (April 2025), Idaho Cattle Association *Line Rider* magazine and in *The Idaho Enterprise* newspaper (May 15, 2025). We hope that additional ranchers will consider adopting targeted grazing for invasive annual grasses and will utilize spatial satellite imagery to assist in management.

- Cattle gained 0.68 lbs/day in 2021 and lost 1.87 lbs/day in 2022.
- Cattle grazed more on south slopes with better quality forage ($\approx 58\%$ digestibility; 2021) and more on north slopes with poor quality forage ($\approx 46\%$ digestibility; 2022). Our hypothesis is that more green and growing cheatgrass was present on south slopes during the wetter year.
- Cattle spent more time grazing in 2022 to try to compensate for decreased forage quality but were largely unsuccessful due to reduced energy intake. (Figure 1).
- The need to provide additional nutritional supplements to available forage was predicted by the satellite imagery which is obtained every eight days.

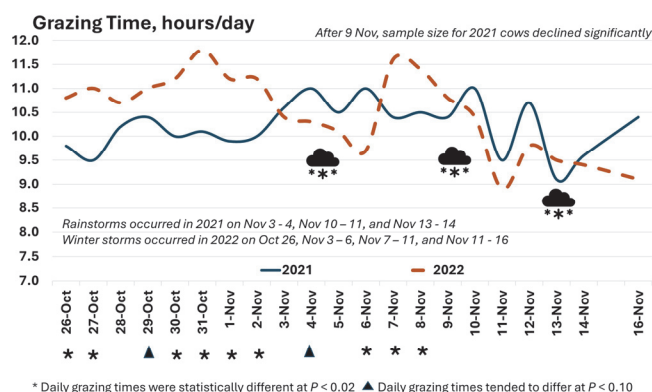


Figure 1. Daily grazing time for 2021 and 2022 near Malad City.

FOR MORE INFORMATION

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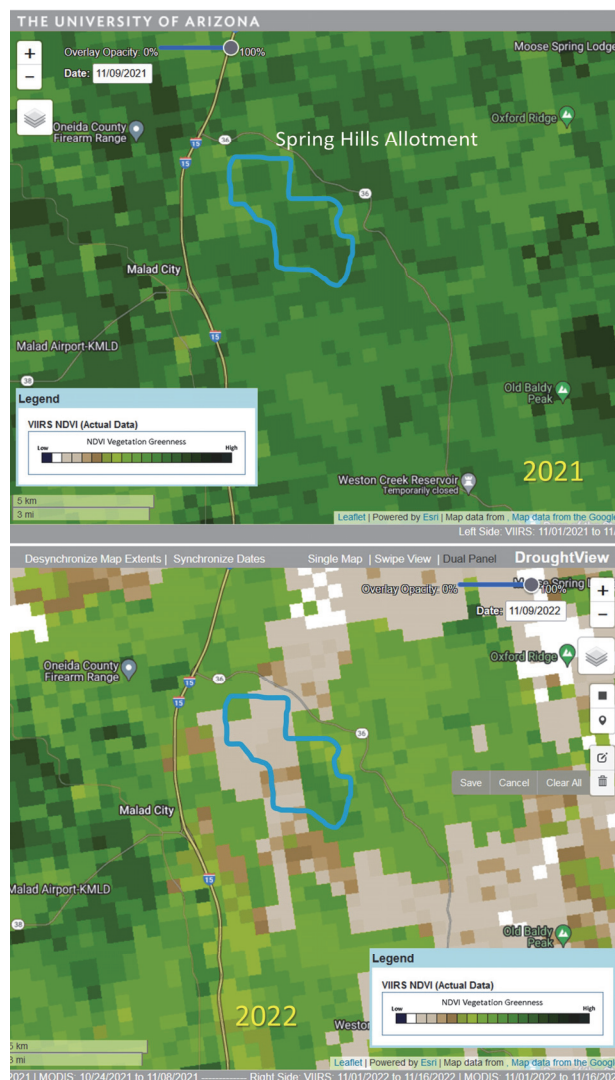


Figure 2. Satellite NDVI imagery demonstrates increased greenness on the Spring Hills Allotment near Malad City in 2021-22.

Cooperators and Co-Sponsors

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