

**AGRICULTURAL RESEARCH FOUNDATION
INTERIM REPORT
FUNDING CYCLE 2016 – 2018**

TITLE: Informing Fire Management Decisions for Control of *Ventenata dubia* in Oregon

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SUMMARY:

Invasive annual grasses, such as cheatgrass (*Bromus tectorum*) and medusahead (*Taeniatherum caput-medusae*) are having a negative impact on millions of acres across the western US. These annual grasses can displace native species, lower forage quantity and quality, lower species diversity and richness, and lower wildlife habitat quality. *Ventenata* (*Ventenata dubia*) is a relatively new invasive annual grass to the ecosystems across the Pacific Northwest. It was first reported in North America in 1952 in Washington and has since spread to 7 western states in the United States (CA, OR, ID, WY, WA, UT, MT) as well as British Columbia and Alberta, Canada. It is unknown when *ventenata* arrived in Oregon, however, its spread has been very rapid. For example, in low elevation grasslands of northeastern Oregon, its rate of increase has been greater than cheatgrass. Some monitoring sites reveal that *ventenata* has nearly doubled in just 5 years. The staggering spread and increase of this species means it is now considered to be the primary invasion threat to intact grasslands in the region. Even though *ventenata* is still relatively new, this small and wispy annual grass is already generating a wide range of environmental and economic issues. Although the impact and spread of *ventenata* has been rapid in the last decade, very little is documented about the basic ecology, the conditions that enable its spread, or how it can be controlled through various management interventions.

OBJECTIVES:

Our overall objective of this study will be to evaluate the effects of fire on *ventenata*.

Specifically, we are examining three main questions:

- 1) Does the cover and density of *ventenata* increase or decrease in subsequent years after a fire?
- 2) How does fire and fire intensity affect the seed bank of *ventenata*?
- 3) How does this response vary with other contributing factors such as: plant community composition prior to fire, grazing, environmental variables, and fire intensity?

PROCEDURES:

Within the largest intact remnant of the grassland type in the region is The Nature Conservancy's Zumwalt Prairie Preserve (ZPP), a 32,000 acre conservation area in the northeastern Oregon. At this site, The Nature Conservancy (TNC) has a set of 16 plots (established in 2004 and burned in 2006) that were used to study the interactions of fire and grazing on the prairie with no post-fire seeding. These large plots (~300 x 900 feet) were burned again in Fall 2016 by the TNC. Their design allows us to look at fire responses with two known fires ten years apart (2006 & 2016). Pre and post-fire vegetation data (in 2016 and 2017 respectively) will be recorded along nine, 100-m (or about 300 foot) transects placed randomly within each plot. Along each transect measures of plant cover and soil cover characteristics (e.g., rock or bare ground) will be

recorded. In addition, measures of all invasive grass species will be collected at intervals along each transect. To examine how fire affects the seed bank of ventenata, we tested for changes in density of ventenata seedlings from seed bank samples collected within our plots pre and post-fire. Because fire intensity can be variable across the landscape, the effects of the burn on vegetation and soil will be evaluated along the transects using methods developed by the National Park Service. The response of ventenata before and after fire across all plots will be evaluated with potential contributing factors to examine the influence of different plant communities, grazing, precipitation and temperature, and fire severity.

SIGNIFICANT ACCOMPLISHMENTS TO DATE:

We completed pre-burn vegetation sampling in Summer of 2016 and collected seed bank samples pre- and post-burn in Fall of 2016. The seed bank study was completed in the Fall/Winter of 2016 and we are currently working through data analysis in anticipation of manuscript preparation this Spring 2017. The pre-burn vegetation sampling was combined with other previously collected data on the abundance of ventenata on the Zumwalt Prairie Preserve. The results provide a look at this species spread in relation to past fires and annual variation and are being presented in an undergraduate research poster at the Society for Range Management with a manuscript submission to follow in Spring 2017. Our next step will be to complete the post-fire vegetation monitoring in Summer 2017 and complete other data analysis.

ADDITIONAL FUNDING RECEIVED DURING PROJECT TERM:

We obtained an OSU Branch Experiment Station Internship (\$3,500) to offset some costs of undergraduate summer salary.

FUTURE FUNDING POSSIBILITIES:

We are looking into using this study to leverage additional funding for research into fire and management of *Ventenata dubia* across the Blue Mountain Region. Possibilities include the Joint Fire Sciences Program and the USDA-NIFA (AFRI Foundational Program). We are also applying for support through the OSU Branch Experiment Station Internship program again for summer 2017.