

# The Use Of Goat Grazing To Biologically Suppress Perennial Pepperweed

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## ABSTRACT

Perennial pepperweed (*Lepidium latifolium*) is a creeping rooted exotic weed that has infested riparian areas, native hay meadows and agronomic fields throughout the western United States. Perennial pepperweed is a highly invasive weed that causes management and economic problems through the loss of diversity and quality forage. The use of herbicides is the most common practice in the effort to control this invasive perennial weed, but in recent times there has been increasing discussion on the use of biologically suppressing this weed through sheep and goat grazing. We investigated the grazing of perennial pepperweed by goats during 1998 and 1999 in northwestern Nevada. Eight 0.1 hectare enclosures were constructed to monitor the utilization and effect of goat grazing on perennial pepperweed. Four of the 0.1 hectare enclosures were grazed and combined with various herbicidal treatments, while the remaining 4 enclosures were grazed throughout the summer and the seeded to a perennial grass. Heavy grazing of perennial pepperweed decreased forage yield by 78%, yet did not decrease the number of perennial pepperweed plants in the plots. The control of perennial pepperweed using the combined grazing with herbicidal treatments was not significant ( $P \geq 0.05$ ) compared to the herbicidal treatments alone. Grazing perennial pepperweed as a control method followed by seeding was unsuccessful due to the fact that the sprouting perennial grass seedlings could not compete with the dense creeping rooted perennial pepperweed population. The suppression of perennial pepperweed with the use of selective herbicides combined with seeding a competitive perennial grass was significantly ( $P \leq 0.05$ ) more successful than the goat grazing treatments combined with seeding the same perennial grass



Figure 1. The aggressive nature of perennial pepperweed.

## INTRODUCTION

Perennial pepperweed (*Lepidium latifolium*), native to eastern Europe and Asia was accidentally introduced into North America early in the 20<sup>th</sup> century (Young et al. 1995). Perennial pepperweed is a highly invasive, creeping rooted weed that has invaded riparian areas, native hay meadows and agronomic fields. Resource managers are increasingly concerned about this weed as management problems arise and the aggressive nature of this weed converts formerly productive, diverse habitats into monocultures of perennial pepperweed (Figure 1). The invasion of this aggressive weed has affected wildlife species diversity and richness, agriculture produces, and the range livestock industry in the Inermountain Area. In more recent times there has been increasing discussion in the use of goats or sheep to biologically suppress perennial pepperweed or aide other control treatments such as herbicides. We experimented with the use of goats in grazing perennial pepperweed to aide in the control and ultimate suppression of this aggressive weed in 1998 and 1999 in northwestern Nevada.



Figure 2. Goats grazing perennial pepperweed.



Figure 3. Heavily grazed perennial pepperweed plot.



Figure 4. Regrowth of perennial pepperweed shortly after being heavily grazed.

## METHODS

Eight 0.1 hectare enclosures were constructed in a perennial pepperweed infested agronomic field in northwestern Nevada in the spring of 1998. Four of the enclosures were heavily grazed by 25 goats and followed up by various herbicidal treatments and subsequent fall seeding of tall wheatgrass (*Elytrigia elongata*). The remaining four enclosures were heavily grazed one at a time and then rotated to the next enclosure. This continuous rotation took place from May through August. Herbage yield data was collected before and after each grazing event as well as total number of plants. Tall wheatgrass was seeded in September following the removal of the goats. Tall wheatgrass seedlings were recorded the following spring through summer months as well as perennial pepperweed herbage yield and plant density.

## RESULTS and DISCUSSION

The perennial pepperweed control plots yielded 6,400kg/ha (Figure 2). Following the grazing of 25 goats in the 0.1 hectare enclosure this yield was reduced to 933kg/ha (Figure 3), but 4 weeks later the yield was back up to 2,100kg/ha (Figure 4). Perennial pepperweed plant density averaged 8,842/ha in the grazed plots compared to 13,242 in the control plots, a 33% reduction, which is not enough when you have an aggressive creeping rooted perennial weed (Figure 5). The grazing of goats or sheep does not affect the massive and extensive root system of perennial pepperweed. Herbicides alone also can not affect this massive root system if there is not a competitive, desirable plant species to help suppress this aggressive weed. Applications of herbicides combined with the seeding of a desirable perennial forage species could team up to achieve such a suppression (Young et al. 2002). There was no significant ( $P \geq 0.05$ ) effect of using goats to aide in the suppression perennial pepperweed. The use of 2,4-D (2,4-dichlorophenoxy) acetic acid, at the time of perennial pepperweed flowering or budding (June) followed by the seeding of tall wheatgrass in the fall, and application of 2,4-D at low rates over the tall wheatgrass seedlings the next spring gave the best perennial grass establishment and suppression of perennial pepperweed (Figure 6).



Figure 5. Perennial pepperweed is an aggressive creeping root weed.

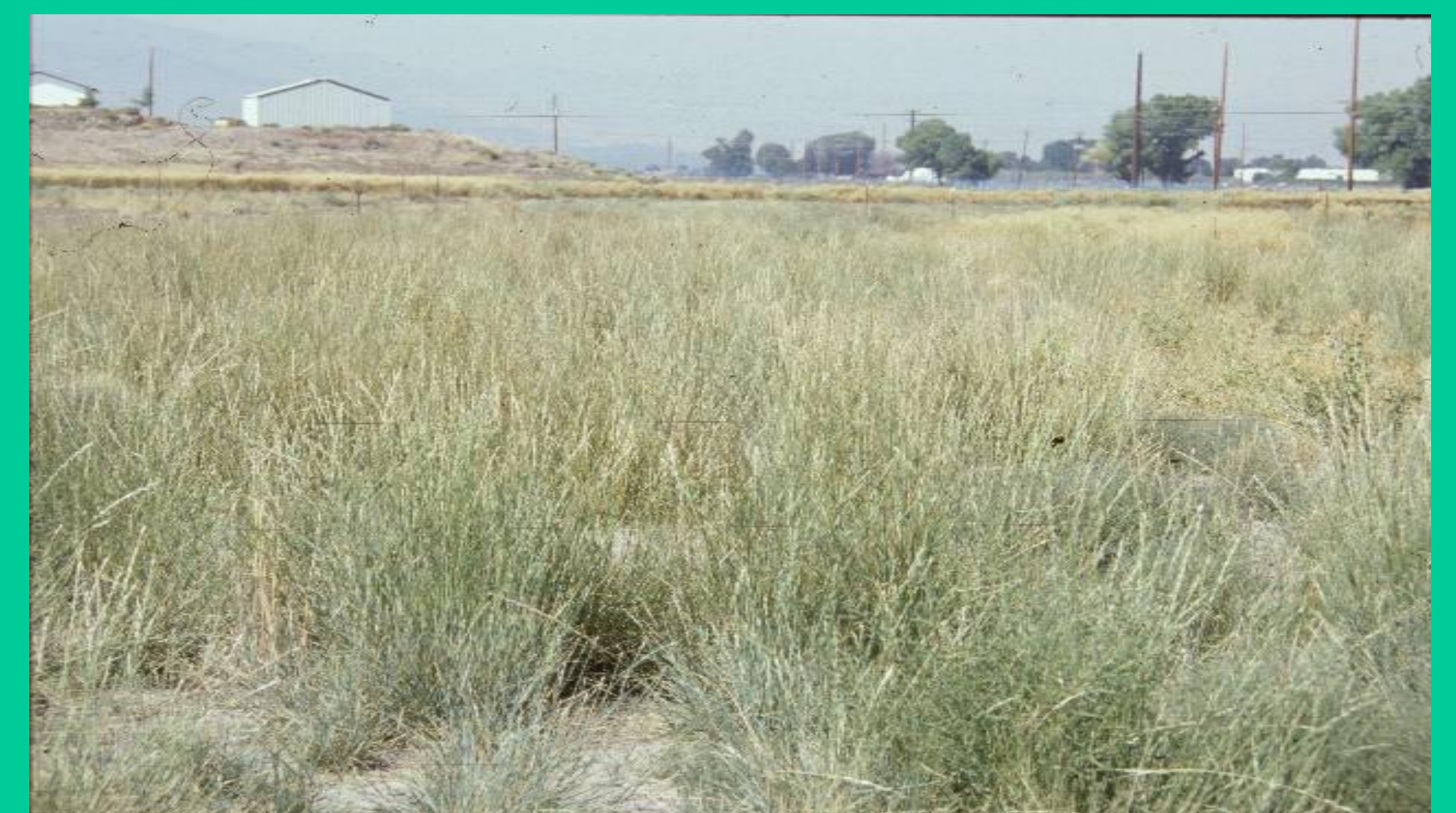


Figure 6. The combination of 2,4-D and tall wheatgrass suppressing perennial pepperweed.

## LITERATURE CITED

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