

Sites Where Medusahead Grows



Environmental Factors Related to Medusahead Distribution



B. E. Dahl and E. W. Tisdale. 1975. *J. Range Manag.*, Vol. 28:6, pp. 463-468.

Location: Idaho

Objective: To determine site characteristics that were or were not associated with vigorous medusahead stands.

Methods: Macroplots, each 10 feet square, were permanently marked and studied intensively throughout major areas of rangeland in Idaho infested by medusahead. Plots were placed on areas where sites heavily infested by medusahead were close to areas without medusahead, but were similar in degree of

depletion (i.e., mostly without perennial species). One plot was placed on the site occupied by medusahead and another on the area where medusahead was rare or lacking. Occasionally, plots intermediate between these conditions were chosen. Data on elevation, aspect, percent slope, position on slope, vegetation, and soils were obtained at each plot.

Results: In southwestern Idaho, disturbed sites with well-developed soil profiles were dominated by medusahead, while adjacent areas with weakly developed profiles were generally dominated by cheatgrass.

Sites lacking medusahead often had the same soil horizon sequence as those with medusahead, but differed in degree of structural development, clay content of the B2, or depth to the strongest developed horizon. Yet, in many cases, adequate moisture appeared to compensate for weak development of the B2 horizon and low clay content. More precipitation (14-18 inches annually), plus a relatively mild climate with precipitation mainly in the winter months, produced an environment where medusahead flourished without a strong soil profile development.

Conclusions: As medusahead plants required about 2 to 3 weeks longer than cheatgrass to mature in the spring, they require a source of moisture for a longer period. Soils with high clay content have higher water holding potential, and thus favor medusahead establishment over cheatgrass. Sites where extra water is received from run-off or regions with a distinct mediterranean pattern of winter precipitation with moderately well-developed soils may also be highly susceptible to medusahead invasion if the perennial vegetation has been lost.

Invasion of Medusahead into the Great Basin

James A. Young and Raymond A. Evans. 1970. *Weed Science* 18: 1, pp. 89-97

Location: Reno, Nevada to Northeastern California

Vertisol (churning clay soils) sites with sparse native plant communities are more susceptible to medusahead invasion than more complex low sagebrush (*Artemisia arbuscula* Nutt.) or low sagebrush-woodland communities on related clay soils. Yet, if the more complex communities are degraded to a low seral state, medusahead can invade and occupy the site. Wet meadows and burned coniferous forest sites at high elevations were the only sites where medusahead occurred on soils with textures

other than clay. Big sagebrush (*Artemisia tri-dentata* Nutt.) communities on medium to coarse textured soils were very resistant to medusahead invasion.

Medusahead and Clay: The Rarity of Perennial Seedling Establishment

James A. Young, Charlie D. Clements and Glenn Nader. 1999. Rangelands 21:6, pp. 19-23.

This paper describe the nature of the range site in the western Great Basin most frequently infested with medusahead and contrast perennial grass seedling recruitment during drought, moderate, and exceptionally favorable seasons for seedling recruitment.

Degradation of Lahontan sagebrush sites occurs first when these sites are invaded by cheatgrass. The cheatgrass is then replaced by medusahead, which lays down heavy litter, supporting recurring wildfires, which kill the non-sprouting shrubs. Once the shrubs are gone the eolian derived mounds erode away and the entire system reverts to a clay-rock surface. The result is a drastic change in seedbed diversity and quality. Germination sites are greatly reduced because all of the litter and microphytic crust sites, suitable for shrub seed growth, that form on shrub mounds are lost. This opens up the clay bedded soils, and removes the protective crusts established by the sagebrush stands. The shrinking-swelling, frost heaving clays provide a very unstable and hostile environment for germination and seedling establishment of most grasses, except medusahead. This presents a huge obstacle for establishing any competitive perennial plant species.

Most perennial grass species were not competitive with medusahead, in the studies of Young et al. (1999) with the exception of Sherman Big Bluegrass. More research is needed to determine the overall effectiveness of the perennial grass in competing with Medusahead stands.

Comparison of Medusahead-Invaded and Non-invaded Wyoming Big Sagebrush Steppe in Southeastern Oregon

Kirk Davies and Tony Svejcar. 2008. Rangeland Ecol. & Manage 61:623-629

Study Location: Oregon

Objective: To estimate the impact of medusahead invasion, vegetation characteristics were compared between invaded and noninvaded Wyoming big sagebrush steppe communities that had similar soils, topography, climate, and management.

Results:

- Perennial grass cover was 15 times greater in non-invaded compared to invaded plant communities, biomass of perennial grasses was also greater.
- Sagebrush cover and density were greater in non-invaded compared to invaded communities.
- Biomass production was greater for perennial (2 times) and annual forb (45 times) in non-invaded than invaded communities.
- Species richness and diversity were greater in the non-invaded than invaded plant communities.

Crested Wheatgrass Defoliation Intensity and Season on Medusahead Invasion

Roger Sheley, Brett Bingham, and Tony Svejcar. 2008. Rangeland Ecol. & Manage 61:211–217

Study Location: Oregon

Objective: To determine the effects of timing and clipping intensity of crested wheatgrass on medusahead density and biomass. We thought that plots clipped in the spring at 60% or more of crested wheatgrass biomass would have the highest medusahead density and biomass compared to other plots.

Methods: Eighteen treatments (six clipping levels, three seasons of clipping) were applied to plots 36 in by 36 in on two sites with varying levels of clay in the soil. Crested wheatgrass plants were clipped in 2004 and 2005 - 0%, 20%, 40%, 60%, 80%, and 100% in the spring, summer, or fall. Density of crested wheatgrass and medusahead was sampled in June 2005 and 2006 and biomass was harvested 2006.

Results:

- Site had a greater impact on medusahead invasion than either clipping intensity or timing of clipping.
- Soils high in clay favor medusahead invasion
- Sites with high levels of biomass of perennial grasses can resist medusahead invasion
- On higher clay sites with some medusahead, fall clipping of crested wheatgrass reduced the density

of medusahead by 50% or more compared to spring clipping.

- The goal of any management program should be to maximize resource use by the desirable plant species during April to late July. Don't graze until late summer or fall.