

Prediction and Prevention of Seed Production in Jointed Goatgrass

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Objectives

1. To determine if growing degree-days (GDD) can be used as a predictor to determine time of seed production of jointed goatgrass.
2. To determine the effect of mowing or herbicide application timing on jointed goatgrass (JGG) seed production.

Results (Objective 1)

Time of seed production during JGG development occurs very soon after anthesis (photo #1). Timing of anthesis and subsequent seed set based on GDD differed between two years of evaluation (Figure 1). This brings into question the feasibility of using GDD to predict timing of seed set in JGG.

Other studies have shown that timing of reproductive development in JGG can be altered by prevailing temperature conditions during vernalization. Differences observed in seed set timing in this study may have been due to differing vernalization conditions between years.

Results (Objective 2)

JGG seed development can usually be prevented by application of glyphosate, paraquat, or mowing before anthesis (Figure 2). Delay of control measures resulted in increasing viability and number of JGG seeds. The rapid plant tissue disruption from paraquat treatment prevented viable JGG seed production at later application timings than did glyphosate application (3 of 4 studies). Mowing prevented viable JGG seed production at later timings than did glyphosate application (3 of 4 studies). Glyphosate applications resulted in a relatively slow desiccation, and destruction of plant tissue, relative to paraquat application, or mowing. JGG control measures need to be applied prior to anthesis to prevent JGG seed production.

Photo #2. Jointed goatgrass nursery for growing degree-day and herbicide/mowing studies near Pendleton, OR.



Figure 1. Relationship between accumulated growing degree-days and time of seed set in jointed goatgrass in two years.

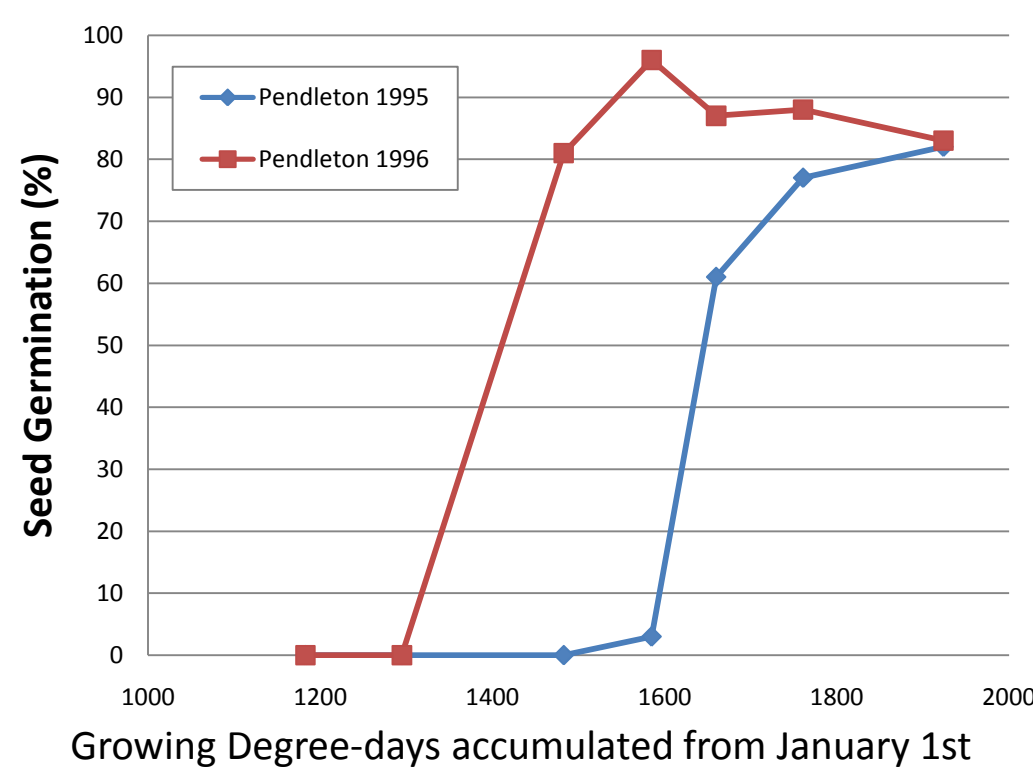


Figure 2. Influence of application timing of glyphosate, paraquat, or mowing on viable seed production of jointed goatgrass at Pendleton, OR or Pullman, WA in 1995 and 1996.

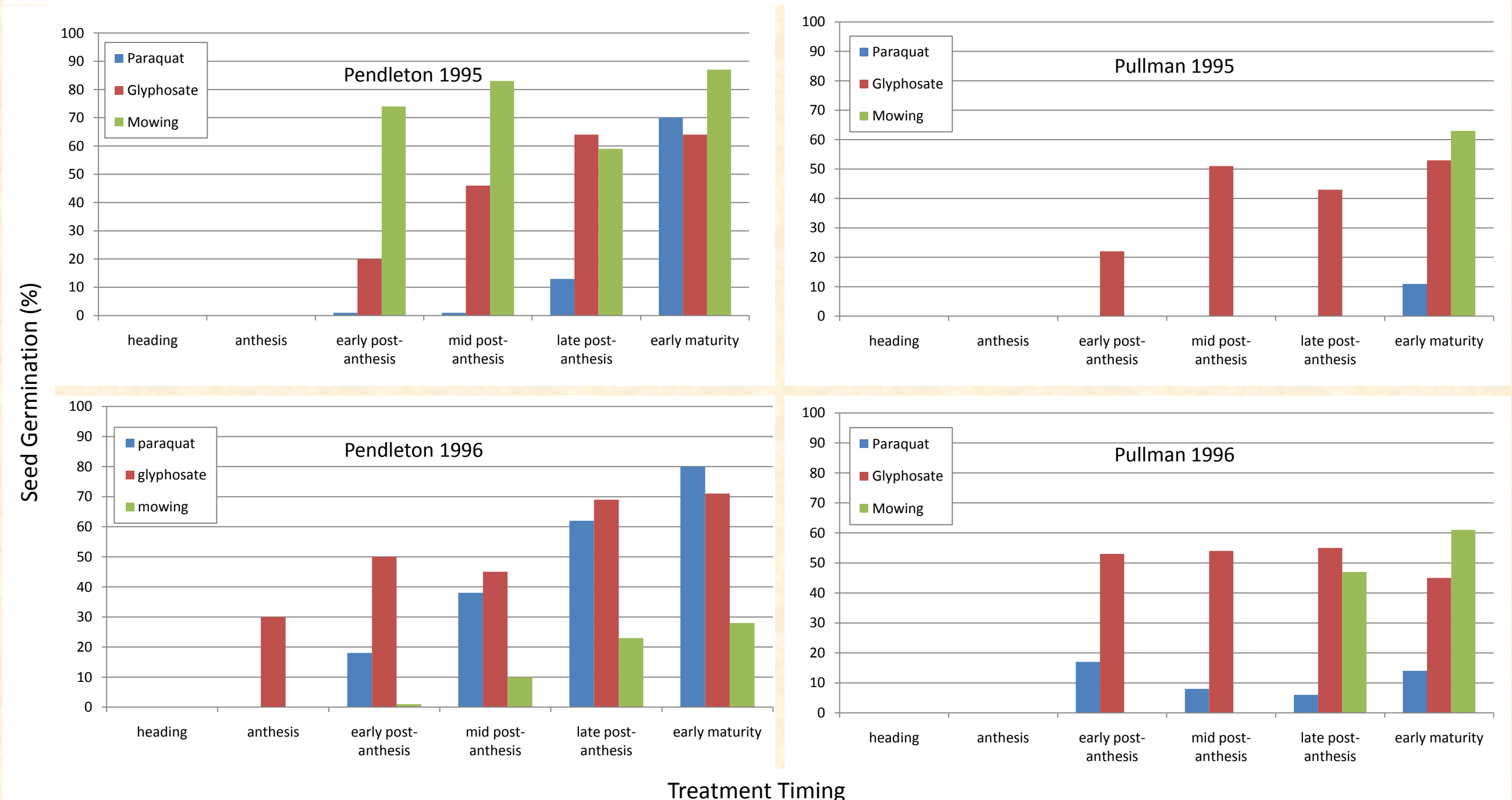


Photo #1. Jointed goatgrass anthesis

