

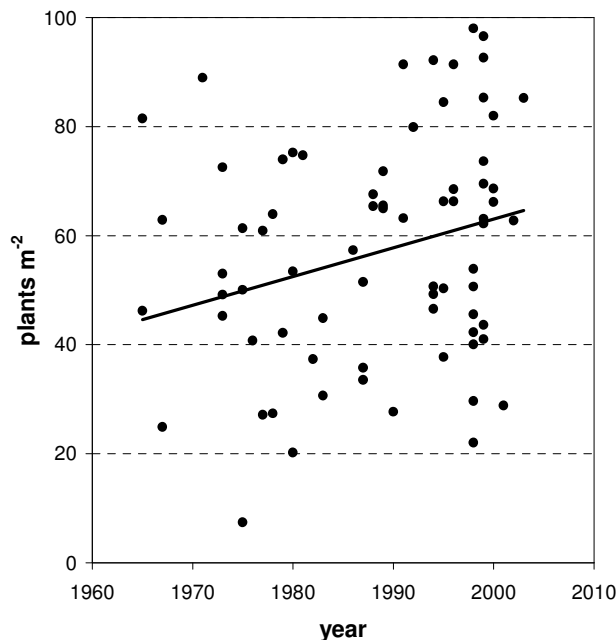
## Persistence of Rotationally Grazed Red Clover in Mixed Stands

Heathcliffe Riday and Michael D. Casler

USDA-ARS, US Dairy Forage Research Center, Madison, WI 53706

Red Clover (*Trifolium pratense*) is an important forage legume in grazing pastures. Historically red clover was limited by its comparatively lower stand persistence in hay and grazed systems. Smith (2000) demonstrated increased persistence under hay management achieved through over 30 years of breeding. No studies have been conducted to ascertain historic plant breeding persistence gains of red clover cultivars tested under grazing management in grass mixture. In addition, little data is available comparing the persistence of ‘grazing tolerant’ red clover varieties released in the past decade with standard hay varieties. The objective of this study was to measure and compare persistence in a broad range of red clover varieties and experimental populations under grazing management in mixture with a grass companion. Four replicates of 225 red clover populations were seeded in Apr 2004 in mixture with ‘Barlexa’ tall fescue (*Festuca arundinacea*) in one by eight meter plots at Lancaster, WI. Stands were rotationally grazed. Grazing was initiated on 30-45 cm tall forage. Grazing events lasted 24 hours with 45 Mg ha<sup>-1</sup> of cattle (*Bos taurus*) applied to the pasture. Immediately following grazing events stands were clipped to 10cm to create an even stand. Plant counts were taken in Jul 2004, May and Sep 2005, and May 2006; height and vigor were measured in Jul 2004 and Sep 2005; and ground cover was measured May and Oct 2005, and Apr 2006. May 2006 plant counts showed a 0.5 plant m<sup>-2</sup> increase in red clover persistence under grazing per year for populations released over the past three decades (Fig. 1;  $p = 0.025$ ). However, large variation among varieties in any release year was observed as well ( $r^2 = 0.07$ ). Grazing varieties ranked well for May 2006 plant counts [‘Cinnamon Plus’ (Rank = 3; 97 plants m<sup>-2</sup>), ‘Redlangraze’ (Rank = 15; 85 plants m<sup>-2</sup>), and ‘Redlangraze II’ (Rank = 26; 78 plants m<sup>-2</sup>)],

**Figure 1.** Third spring (May 2006) persistence (plants m<sup>-2</sup>) of grazed red clover populations grown in grass mixture versus year of population release.



especially compared to their non-grazing earlier versions [‘Cinnamon’ (Rank = 58; 68 plants m<sup>-2</sup>) and ‘Redland III’ (Rank = 65; 66 plants m<sup>-2</sup>)]. ‘Astred’ an Australian grazing red clover, however, fared poorly (Rank = 170, 38 plants m<sup>-2</sup>). Increased average red clover plant height measured in 2004 and 2005 and initial red clover plant stand counts in 2004 were positively correlated with increased May 2006 plant densities ( $r^2 = 0.20$  and 0.18 respectively). This study reveals that breeding for red clover stand persistence under hay management has increased persistence under grazing management and that breeding for increased persistence under grazing has been successful in some instances.

**References:** Smith, R.R. 2000. Red Clover in the 21<sup>st</sup> century. Proc. 24<sup>th</sup> Forage production and use symposium. Wisc. Forage Council.