The response to shade of two cultivars of Birdsfoot trefoil (*Lotus corniculatus* L.)[1]

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Empire and Maitland birdsfoot trefoil were compared to determine whether their inherent differences in seedling vigor and growth habit would impart a difference in response to shade.

A field trial was conducted to evaluate the effects of companion crops and weeds on the establishment of the 2 trefoil cultivars. Light penetration through the cereal and weed canopies to the trefoil, and to ground level, was measured throughout the season.

In general, companion crops were more competitive than weeds. In the year of seeding, trefoil yield averaged 2.35 t/ha in the weed-free plots, 0.91 t/ha in the weedy plots, and only 0.22 t/ha in the companion crop treatments. Trefoil density in the fall of the seeding year was not effected by establishment method. Abnormal winter conditions resulted in unexpectedly higher second year trefoil density and yield in the companion crop treatments than in the weed-free treatments.

Light penetration to ground level was as low as 8% through cereal companion crops 51 days after planting, and as low as 5% through a weed complex by the end of the season. After mid season, the undersown trefoil received a greater intensity of light as it grew into the upper canopy.

The response to shade of the 2 trefoil cultivars was compared in a field trial using 5 levels of artificial shade. The results suggest that moderate shade does not have any negative effects on yield, regrowth, and density. These characters were at a maximum at a shade level of about 25%. Empire and Maitland did not show a different response to shade for yield, regrowth, density, or any of the vegetative morphological characters examined. A difference in response to shade was found only for the number of inflorescences per plant.

The photosynthetic response to light intensity was measured in the growth cabinet. Photosynthetic rate, as expressed by net carbon exchange, was not different for the 2 cultivars. The results suggest that light saturation occurs at an intensity below that of full sunlight.

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[1]M.Sc. Thesis, McGill University, 1981. Prof. B.E. Coulman, Thesis Director.