

Evaluation of a white clover variety with increased resistance to stem nematode (*Ditylenchus dipsaci*) under sheep grazing and cutting

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Introduction Stem nematode (*Ditylenchus dipsaci* (Kühn) Filipjev) is a major pest of white clover (*Trifolium repens* L.) in UK pastures (Cook *et al.*, 1992a) and in other parts of the world. In a previous trial, resistant and susceptible selections yielded the same in three years in the absence of the nematode but, on infested plots, the susceptible yielded the same as the resistant selection in year 1 but only 68 and 58% in years 2 and 3, as the nematode infestation increased (Cook *et al.*, 1992b). We have now developed varieties with enhanced resistance to this pest by screening under controlled conditions (Plowright *et al.*, 2002). We describe an experiment to test the hypothesis that stress imposed on the plant by grazing as opposed to cutting management would exacerbate the effects of nematode infestation and accentuate the advantages of resistance through longer survival of clover plants.

Materials and methods Two morphologically similar white clover lines of small leaf size, selected from the same parental material for stem nematode resistance (AC63) and susceptibility (Ac4586) and a 50:50 mixture were sown (3kg/ha) in 2000 in 5 x 4m plots with perennial ryegrass (25kg/ha cv. Fennema). Two adjacent experiments were sown, each in a randomised complete block design with four replicates, one as the stem nematode-free (control) and the other infested with nematodes at the end of the establishment year. Plots were divided into areas subjected to either cutting or continuous sheep grazing. Cutting and sampling of all areas was carried out 6 times during the growing season at 5 week intervals to determine dry matter yield and clover content. Statistical analyses (ANOVA) were conducted separately on each experiment.

Results On the infested trial, stem nematode symptoms were present during the first harvest year but severe infestations did not develop in the second year. Ac4586 yielded least in 2002 ($P < 0.001$) under both managements (Figure 1). Grazing reduced yields of all three clovers in the infested trial in 2002 ($P < 0.05$) and in both trials in 2003 ($P < 0.001$). To compare the trials, yields were expressed as $100 * (AC63 - Ac4586) / Ac4586$.

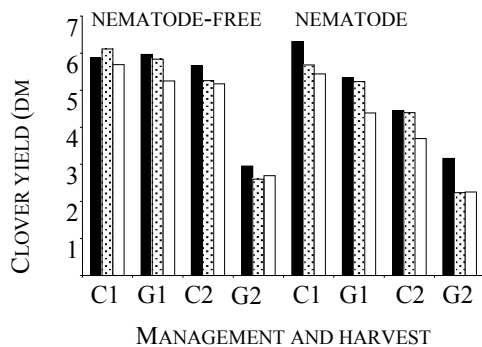


Figure 1 Yields in two harvest years (1: 2002; 2: 2003) of three clover varieties (black column: AC63, resistant; white: Ac4586, susceptible; stipple: 50:50 mixture) in trials managed by cutting (C) or grazing (G) and infested or not by stem nematode

Resistant AC63 yielded 6% and 11% more than Ac4586 under cutting and grazing, respectively, on the nematode-free trial and 20% and 41% on the infested trial.

Conclusions In the absence of a severe infestation of stem nematode, grazing had the major impact on clover yields and persistence. The resistant clover yielded more than the susceptible and the differences appeared to be greater under grazing than cutting. To date, the results lend support to the previous trial indicating an advantage of resistance. The resistant AC63 has good yields and agronomic features.

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