THE EFFECT OF PERENNIAL RYEGRASS (*Lolium perenne*) SOWING RATES ON WEED ESTABLISHMENT, AFTER ONE YEAR.

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fulfilment of the requirements for the degree
of Master of Applied Science
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Errata

Key: P = page; ln = line. Underlined characters signify inserted text; crossed out characters are replaced by underlined ones in the same line.

P.1, ln.14: cocksfoot (*Dactylis glomerata*) and timothy (*Phleum pratense*)

P.7, ln. 2: ~~This type of response~~ Plasticity of an individual

P.17, ln. 7: being dormant (Young 1985)

P.33, ln: indicated in Table 3.1. The tray experiment was a completely randomised design with uneven replication.

P.36, ln 8: 3.2.4. Data analysis. Data concerned with sowing rates was investigated using analyses of variance (ANOVA). Data related with ryegrass tiller counts was investigated using regression analyses.

P. 42, ln. 8: With Treatment 1 (0/0) removed a ~~A~~ linear regression was

P. 78: to be followed. Mapping was carried out using a sheet of acetate on a piece of glass that was positioned above the sub-plot. The position of each weed seedling in the sub-plot was marked onto the sheet of acetate. The same sheet of acetate was used at each count for that sub-plot, however a different coloured pen was used each time. This enabled the fate of existing seedlings to be checked and newly emerging seedlings identified as such.

P. 78: 4.2.3. Data analysis. Data concerned with sowing rates was investigated using analyses of variance (ANOVA). Data related with ryegrass tiller counts was investigated using regression analyses.

Abstract

Two trials were conducted to determine whether the weed control benefits of high sowing rates of perennial ryegrass (*Lolium perenne*) continued into the second year after sowing. Seeds of Scotch thistle (*Cirsium vulgare*), nodding thistle (*Carduus nutans*), ragwort (*Senecio jacobaea*) and hedge mustard (*Sisymbrium officinale*) were sown into established perennial ryegrass and white clover (*Trifolium repens*) swards both in trays and in the field, in late autumn. The emerging weed seedlings were mapped at intervals to enable their fate to be followed. In the trays, seedlings were mapped at four week intervals, and the experiment continued for four or five months, depending on the species. In the field, weed seedlings were mapped both before and after each grazing and the experiment continued for seven months.

The trays with low ryegrass sowing rates had a higher density of white clover than those trays with high ryegrass sowing rates. In the field plots with low sowing rates, both the broad-leaved weed population and volunteer grasses were more abundant than in the high ryegrass sowing rate plots. This resulted in the different treatments having a similar competitive ability against the sown weed seeds, one year after the swards were sown.

Both nodding thistle and Scotch thistle emergence was extremely low in the bare ground trays, probably relating to seed predation of these large seeds off bare soil. Scotch thistle and hedge mustard emergence were both reduced by high sowing rates of perennial ryegrass when compared to trays and field plots sown with white clover only. Nodding thistle and ragwort however provided some unusual results. Both of these species experienced an increase in total emergence as ryegrass sowing rate increased. With nodding thistle, this occurred in the field and with ragwort, in the trays. This obviously was unexpected but in reality the increases in emergence, although significant, were small and of little practical importance. The increases probably related to the similar competitive ability of the swards one year after pasture sowing. Emergence of ragwort in the field and nodding thistle in the trays was not affected by ryegrass sowing rate. For all species, in both the field and the trays, emergence was delayed as the sowing rate increased.

There was very low mortality in the tray experiment. Mortality was much higher in the field due to the effects of grazing animals and also the longer time frame of the field experiment. All hedge mustard seedlings that emerged in the field were killed, and only one nodding thistle seedling survived to the end of the experiment. With both Scotch thistle and ragwort, seedlings seemed to have a higher chance of surviving in the high density ryegrass treatments, probably due to the physical protection from grazing animals provided by ryegrass.

High mortality in the field experiment rendered seedling size data meaningless. In the trays, for all species, the heaviest seedlings were found in the treatments with either bare ground or where only clover was sown, indicating that competition from ryegrass had a serious negative effect on weed size. Weed size did not vary significantly as ryegrass sowing rate increased.

In conclusion it would appear that most of the weed control advantages from higher sowing rates of perennial ryegrass are obtained in the first year after sowing, as all swards that contain perennial ryegrass appear to have a similar competitive ability against invading weeds in the second year after sowing.

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