

## SOME RESEARCH ON NITROGEN AND GRASSLAND IN WALES - TEN YEARS OF RESULTS

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In the last ten years I have been involved with 27 experiments on field swards, mostly harvested by cutting. The two to seven N levels compared ranged from 0 to 600 kg N per ha per year. The typical plot size was about 10 m<sup>2</sup>. In some experiments individual plots have been harvested repeatedly over one to four years comparing different intervals between harvests. In other experiments particular periods of regrowth, ranging in length from 3 to 14 weeks, have been studied in detail by harvesting a succession of plots at weekly, or shorter, intervals.

The research dealt with the examination of species (e.g. *Lolium* spp., *Festuca* spp., *Dactylis glomerata* and *Trifolium repens*), plant growth aspects (e.g. number of leaf initials, extension and death of leaves, number of tillers, herbage yield) and nutri-

tive aspects (e.g. digestibility of total herbage and of crop fractions, mineral content).

The poster displays papers describing results of this research and shows some results from two recent experiments.

In one experiment five N levels ranging from 0 to 525 kg N per ha per year were applied to five grasses in 1977 and 1978. The relative shapes and slopes of response curves (means of five grasses and two years) for different parameters such as dry-matter yield, N yield, number of tillers, number of leaves, area per leaf blade and number of leaf primordia, are shown.

From another experiment are shown effects of level of N and swath thickness on the drying rate of herbage in the field during 1978 and 1979.

## SWARD DENSITY AND PRODUCTIVITY AFTER DIFFERENT INTENSITIES OF NITROGEN FERTILIZATION IN PRECEDING YEARS

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With continuous mowing the sward is generally more dense with a moderate than with an intensive fertilizer nitrogen regime. In a field trial the productivity of swards of various densities were compared at a high rate of nitrogen. Moreover, changes of the swards were investigated. Differences in density had been created by applications of 40, 60, 80, 120 or 160 kg N per ha per cut in pretreatment years (prior to 1978), the extreme applications ranging from 160 or 200 to 800 or 960 kg N per ha per year, corresponding with 4 or 5 to 5 or 6 cuts per year. In the experimental year 1978 these so-called 'low-N' to 'high-N' swards received an equal rate of 120 kg N per ha at each cut, with 6 cuts totalling 720 kg N per ha.

Results in the experimental year showed:  
- Differences in dry matter yield only oc-

curred at the first cut (in May): the original 'low-N' swards produced approximately 30 per cent more dry matter than the 'high-N' swards. In later cuts yields did not differ significantly.

- Differences in tiller density between the original 'low-N' and 'high-N' swards had disappeared already at the time of the first cut.
- Good relationships were shown between leaf area cover, tiller density, and dry matter yield.

These observations demonstrate that at a high rate of nitrogen application a previously dense 'low-N' sward is able to produce more dry matter than a more open, 'high-N' sward. At such high N rates after the first cut, however, a 'low-N' sward apparently becomes equal to a 'high-N' sward.

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