

CHEMICAL MANIPULATION OF SENESCING GRASSES TO IMPROVE FEEDING VALUE

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Chemical treatment of pasture grasses offers a possible method of conserving dry standing fodder of high feeding value for use during summer. "Hay-freezing" by treatment of mature herbage with paraquat (Gramoxone, ICI) has been tested widely and results in a dead forage reserve with relatively high protein content but does not maintain the original digestibility of the treated material (Pullman and Allden 1971). This paper reports the effects of chemical treatment of mature annual ryegrass pasture with glyphosate (Roundup, Monsanto).

A stand of annual ryegrass (*Lolium rigidum* Gaud.) growing at Mt. Derrimut, Victoria, was sprayed with 180 g (a.i.) glyphosate/ha one week before anthesis and at anthesis (18.10.88). Pasture was harvested at regular intervals and sorted into stem (excluding ear), leaf sheaths and leaf blades. The plant material was analysed for soluble carbohydrates and *in vitro* dry matter digestibility (IVDMD).

The largest effects were seen in stems which comprised the bulk of plant dry matter (55% at anthesis) and were also the least digestible plant part. The IVDMD of stems in untreated pasture declined from 53% at anthesis to 18%, 2 months later (Fig.1). Time-of-spraying was important with grass treated before anthesis retaining higher IVDMD when senescent. The stems of this treatment were still 36% digestible, 2 months after anthesis. Leaf blade IVDMD, by contrast, was not affected and leaf IVDMD declined from 75% at anthesis to about 51%, two months later. The response of leaf sheaths to the treatments was intermediate. The effect of spraying on changes in IVDMD were associated with a delay in the loss of soluble carbohydrates provided pasture was treated before anthesis (Fig. 2). Stems of pasture sprayed before anthesis retained 8.3 % (w/w) soluble carbohydrate as opposed to stems of control plants which retained only 0.5% soluble carbohydrates, 2 months after anthesis. The treatments were also successful in retaining relatively high NDF digestibility.

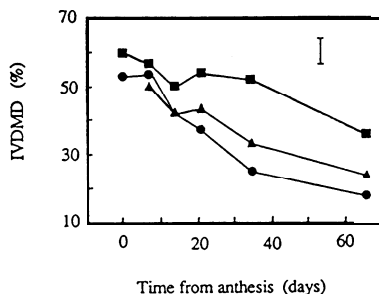


Fig. 1. IVDMD of stems of annual ryegrass sprayed 1 week before anthesis (■), at anthesis (▲) and unsprayed (●). Bar represents LSD ($P = 0.05$).

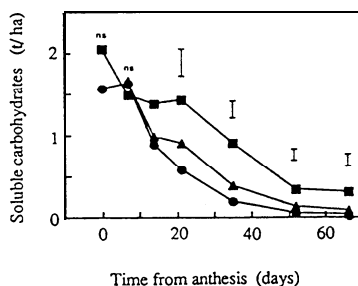


Fig. 2. Soluble carbohydrate yield of annual ryegrass sprayed 1 week before anthesis (■), at anthesis (▲) and unsprayed (●). Bars represent LSD ($P = 0.05$).

Chemical treatment with glyphosate before anthesis retained relatively high IVDMD for at least 3 to 4 weeks after treatment. Thereafter, IVDMD of treated herbage also declined, but this material was still of better feeding value than untreated senescing herbage. Only low rates of herbicide application appear necessary (e.g. Davidson et al. 1988) and this is also an environmentally desirable feature of the forage conservation method.

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