

THE USE OF IMAZETHAPYR AND GLYPHOSATE TO DELAY LOSS OF FEEDING VALUE IN SENESCING RYEGRASS PASTURE

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Abstract. In southern Australia, senescing pasture can significantly restrict the production of grazing animals during summer. Mature herbage has poor digestibility and is deficient in both energy and protein (2). This paper reports the effect of spray topping with imazethapyr and glyphosate on the digestibility of annual ryegrass.

Annual ryegrass, *Lolium rigidum*, growing at Mt Derrimut, Victoria, was sprayed with 50 g (a.i.) /ha imazethapyr (Pursuit [Cyanamid], 0.4% v/v Agral 600) 21 d before anthesis (ear emergence), at anthesis and 8 d after anthesis, or with 180 g (a.i.) /ha glyphosate (Roundup [Monsanto], 0.25% Agral 600) 21 d before anthesis. The grass pasture was harvested regularly after spraying and plant material was analysed for neutral detergent solubles (NDS; 3) and *in vitro* dry matter digestibility (IVDMD; 4).

The IVDMD of pasture treated with imazethapyr was improved only if sprayed before anthesis. This is also the case with glyphosate (1). Both herbicides then maintained stem IVDMD at 60% for up to 40 d after spraying. Thereafter, stem digestibility of treated plants declined. By contrast, the IVDMD of the stems of control plants declined from before anthesis at a rate of about 0.6% units per d and reached a final IVDMD of about 25%, 40 d after anthesis. Stems are a major component of a mature grass pasture (44% of DM at anthesis) and are usually the least digestible plant part. The IVDMD of leaf sheaths was intermediate between that of leaf blades and stems and declined in all treatments as plants senesced. Sheaths of herbicide-treated plants were, however, about 7% units more digestible than sheaths of control plants. The IVDMD of leaf blades of all plants declined after anthesis at a rate of about 0.5% units per d irrespective of herbicide treatment and reached about 55%, 40 d after anthesis. Improved digestibility of stems and sheaths of treated plants was partly due to increased NDS concentrations. Both herbicides increased the growth of secondary tillers. The secondary tillers were of similar IVDMD to leaf sheaths and contributed significantly to the total yield of digestible dry matter (DDM). The yield of DDM in the vegetative part of a senescing pasture normally declines from about anthesis. This loss in yield was immediately delayed by application of glyphosate whereas imazethapyr-treated pasture increased to maximum DDM yield about 2 to 3 weeks after anthesis. At this time, yields of DDM from each herbicide-treated pasture were equivalent and were about 1.5 t DDM/ha larger than in the control, but they declined thereafter. Because the yield differential was not maintained, treated pasture should probably be grazed from about 3 weeks after anthesis. This data ignores the contribution that ears might make to yield of DDM. Because ears of ryegrass shatter in summer it is assumed that they are not generally available as a feed for grazing livestock. Glyphosate decreased seed yield by 81%, reducing both weight per seed and seeds/m². Imazethapyr did not reduce the number of seeds/m², but weight per seed and consequently total seed yield were reduced by 25%.

Both imazethapyr and glyphosate will delay loss of feeding value of the vegetative parts of senescing ryegrass pastures for up to 3 weeks after anthesis and during this period will result in improved digestibility of senescent stems which are usually the least digestible parts of the grass sward. However, before further recommendations can be made, grazing trials must be conducted to determine whether these differences result in improved herbage utilization by livestock and thus increased animal production from treated pastures.

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