

Tillering and its influence on seed yield in Kangaroo Valley perennial ryegrass

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Kangaroo Valley Perennial Ryegrass (K.V.R.) is the earliest maturing perennial ryegrass commercially available. Seed producers of K.V.R. use the pasture for both forage and seed production. It is generally recognised that the earlier a tiller is produced the greater are its chances of flowering and producing seed (1). However, the grass plant is a dynamic population of short-lived tillers and their production and survival will influence both dry matter and potential seed yield. The objective of this study was to determine the contribution of new tillers and seed production in K.V.R.

Method

Forty-eight circular plastic frames (100 cm²) were placed within an existing field experiment in which the effect of time and intensity of defoliation on tillering, herbage production and reproductive development of K.V.R., were being studied.

Tillers within the plastic frames were marked with a coloured 4mm dia. plastic ring on May 30th (Autumn tillers). On August 10th, new unmarked tillers were marked (Winter tillers) with a plastic ring of a different colour. At harvest (November 11th), ryegrass tillers within each frame were cut to ground level and the number of marked, unmarked (Spring tillers) and dead (plastic rings with no live tillers) tillers were recorded. Data was analysed by analysis of variance.

Results and Discussion

The contribution of Autumn and Winter + Spring tillers to a K.V.R. seed crop is shown in table 1.

Table 1: Characteristics of tillers at harvest.

Tiller Type	Survival (\pm SE) %	Seed Head Production % (\pm SE)	Tiller seed Yield (\pm SE) mg
Autumn	80 \pm 10	49 \pm 19	21.4 \pm 1.8
Winter + Spring	47 \pm 19	11 \pm 6	7.2 \pm 3.5

Ryegrass tillers present before the onset of winter have a significantly higher ($p < 0.01$) survival rate to harvest, produce proportionally more seed heads and produce more seed per seed head than Winter and/or Spring tillers (Table 1). In this study, approximately 95% of total seed yield in K.V.R. is contributed by Autumn tillers. It was observed that most tiller death occurred during stem elongation and head emergence which suggests that poor assimilatory capacity of young (Winter + Spring) tillers rendered them short lived and/or unproductive for seed production.

To ensure maximum seeding potential in K.V.R., management practices should aim to manipulate tiller populations so as to encourage maximum numbers and survival of Autumn tillers and a reduction in the production of late tillers.

1. Colvill, K.E. and Marshall, C. 1984. *Annals App. Biol.* 104 543-557.