

Effects of defoliation on pod set and seed yield in a range of medic cultivars

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Annual medics (*Medicago* spp.) currently grown by farmers have been selected for high herbage production and seed yield but attaining high seed yields depends on management practices. Studies with Jemalong and Paraggio barrel medic show that defoliation at the start of flowering is unlikely to decrease seed yield significantly (2, 3). The present study examines the applicability of this strategy to a range of medic species and cultivars (including unnamed genotypes).

Materials and methods

Ten annual medic cultivars of different maturity, flowers per raceme, seed weight and seeds per pod were sown at a rate of 16 kg/ha in May 1991 at the Waite Institute. A randomised complete block design with 4 replications was used. Each plot was split into three: undefoliated or defoliated to 6 cm or to 3 cm at the start of flowering. A 50 cm rotary mower was used for all defoliations. Flowers per raceme and percentage pod set were estimated by the method of Cocks (1). June to September rainfall was adequate for plant growth but October rainfall was only 8 mm.

Results and discussion

Seed yields differed significantly between cultivars (Table 1) but not between defoliation treatments, indicating that yields may be little affected by defoliation if it ceases at an early stage of flowering. The most important factor contributing to high seed yields was a large number of pods/m² ($r=+0.63^{***}$) which was correlated to early flowering ($r=+0.63^{***}$) and percentage pod set ($r=+0.54^{**}$). However, no single attribute accounted for the differences in pods/m² between cultivars (Table 1). Percentage pod set was greater in early-flowering cultivars but negatively correlated ($r=-0.56^{***}$) with the potential sink size (Mean pod weight x Number of flowers per raceme (l)) at each flowering node suggesting that percentage pod set is affected by more than one attribute. Seed yields were not simply related to cultivar maturity or to final dry matter yield, therefore it may be possible to select for high herbage production and high seed yields concurrently.

Table 1. Effect of cultivar on flowering, pod set and seed yield of undefoliated medic swards.

Species	Cultivar	Date of first flower	Potential sink size (mg/node)	Pod set at maturity (%)	Flowers at end-flowering (10 ² /m ²)	Seed yield (kg/ha)
<i>M. littoralis</i>	Harbinger	12 Aug	128	24.7	405	853
<i>M. polymorpha</i>	Serena	11 July	60	39.0	291	866
	SC01011	3 Sept	193	20.9	288	877
	SC01012	30 Aug	122	23.0	352	1161
<i>M. rugosa</i>	Paragosa	23 Aug	69	20.4	517	887
	Paraponto	2 Aug	105	NA	NA	1413
<i>M. scutellata</i>	Sava	5 Aug	268	14.6	110	792
<i>M. tornata</i>	Murrayland	25 Aug	154	NA	NA	474
	Tomafield	3 Sep	273	9.4	694	570
<i>M. truncatula</i>	Paraggio	26 Aug	189	13.2	195	710
l.s.d. (P=0.05)				12.9	230	576

NA = Data not collected

References

1. Cocks, P.S. 1990. Aust. J. Agric. Res., 41. 923-31.

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