

Normal and reduced branching lupins have similar residual value

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Recently, Dr. Gladstones has developed *Lupinus angustifolius* genotypes in which branching is genetically reduced (reduced branching types - RBTs). RBTs have a similar biomass to normal types (1) but in the Geraldton region are 10 to 15% higher yielding than the current branched variety Illyarrie (1,2). A problem facing plant breeders and farmers is whether this increased yield level, without any increase in biomass (i.e. increased nitrogen HI), leads to a reduced residual value of RBTs for following wheat crops.

Methods

The yield of wheat following normal (cv. Illyarrie) and RBT lupins of similar maturity has been compared in four trials.

Results and Discussion

A gross nitrogen budget for the lupins averaged over the four trials showed that both normal and RBTs had the same total nitrogen content in the tops (133 kg/ha). However, 80 kg/ha N was removed in the seed of the RBTs compared with 75 kg/ha N for Illyarrie. Therefore, the residual nitrogen was reduced by 5 kg/ha for the RBTs.

In the subsequent year, the plots were cropped to wheat. Yields for plots receiving no applied nitrogen are given in Table 1. The yield of wheat after reduced branching lupins was similar to the yields following branched lupins. This was due to the fact that the rotational benefits of lupins result from several factors apart from residual N: disease cleaning, K cycling from depth, reduced soil compaction, improved soil structure, etc. It has been estimated that, on average, these other effects account for half of the residual value of lupins (3). The remainder is probably due to N effects. However, as the difference in residual N is small between currently available lupin plant types of the same flowering date, any differences in residual value are below levels detectable in the field.

Table 1: Wheat yields (t/ha.) following lupin types

Wheat following	ECRS 1984	Criddles 1985	Gills 1985	ECRS 1986
Illyarrie	1.85	1.74	2.60	1.98
RBTs	1.89	1.78	2.65	2.00

If future varieties are developed with a greatly increased nitrogen HI it may be possible to detect varietal differences in residual value. However, this is unlikely to be of major agronomic importance as of all the benefits of lupins in rotation, the component most easily replaced by farmers is nitrogen.

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