

## Better lupin husbandry in southern New South Wales

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The enthusiastic acceptance of narrow leaf lupins (*L. angustifolius*) into the cropping systems of southern New South Wales is being delayed by the inability of many farmers to grow lupin crops which are consistently as profitable as the winter cereals. The desired stability of lupin yields will have to come from the identification of (1) better adapted and higher yielding cultivars out of the Western Australian breeding effort and (2) the optimum husbandry for this crop.

Some of our experiences since 1979 are relevant to the latter aspect. We have been comparing the effects of several methods of stubble management and seedbed preparation on lupin yields in a long term rotation experiment at Wagga:

- wheat stubble retained, lupins direct drilled
- wheat stubble retained, lupins sown after one shallow discing
- wheat stubble retained, lupins sown after three shallow discings
- wheat stubble burnt, lupins direct drilled
- wheat stubble burnt, lupins sown after one scarifying
- wheat stubble burnt, lupins sown after three scarifyings

Over the three seasons that we have been studying these treatments, direct drilled lupins have yielded, on average, 16 percent and 39 percent more than those grown after one and three cultivations respectively.

In 1980 and 1981, we were able to compare the effects of mulching and burning the stubble from the previous wheat crop on lupin performance. Over the three tillage treatments, "mulched" plots yielded 13 percent better than "burned" plots.

In 1980 and 1981, lupins direct drilled into the mulch of the previous wheat crop yielded, on average, 51 percent better than those grown where the stubble was burnt and three workings undertaken.

The superiority of direct drilled lupins over those where tillage was employed was largely a reflection of moisture conservation in the autumn when rainfall was too low to bring benefits from the conventional farming techniques; but also of reduced water use by the direct drilled crops after sowing and greater water availability in the spring (R.A. Fischer pers. comm.).

In 1980, the beneficial effects of stubble mulching on lupin yields were associated mainly with a reduced evaporation from the soil surface, both before and after sowing, and a much extended post-flowering phase in the spring.

In 1981, however, weed suppression by the wheat stubble was also a factor. Where the lupins were direct drilled into a mulch, skeleton weed (*Chondrilla juncea*) and wire weed (*Polygonum aviculare*) presence was reduced 47 and 7- fold, respectively, compared with plots where the lupins were sown after burning the stubble and then giving three workings.

If the spectacular improvement in lupin yield achieved in 1980 and 1981 at Wagga by direct drilling into wheat stubble can be extended to other seasons and other sites, then there is clearly a need for change. Lupin growers must assess the effectiveness of direct drilling into cereal stubble in lifting production on their own farms. Seldom has such a simple change in husbandry promised so much. Perhaps this is the key to stable lupin yields.

Many lupin growers would not have combines which will sow into stubble. If, however, direct drilling of cereals into cereal stubble can be shown to present similar yield advantages to those obtained by lupins, there is every justification for farmers to make a change when they are updating their equipment.