

## Evaluation of intercropping for fodder production

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Increases in grain production, total protein and land utilization by intercropping a legume crop with a grass crop are reported from many parts of the world.

In fodder production, high yields are attainable from C4 type summer grass crops and from winter cereals, but when harvested at a stage to maximise DM yield, the protein level of the fodder becomes a limitation to animal production. Growing a legume with the grass crop can improve whole crop protein but have an interaction with total DM yield and total protein yield.

Three experiments were conducted at Kyabram Research Institute with different crops to assess the effect of intercropping on quality and quantity of crop fodder. An attempt was made in each case to allow the legume to make its maximum contribution. Experiment 1 (Maize Dolichos Lab- Lab) had 4 treatments, Experiment 2 (Maize Soybean) 5 treatments and Experiment 3 (Oats Peas) 6 treatments. The table presents the yields from the combination which gave the greatest legume contribution, compared to the grass crop alone.

**Table I. Dry matter and protein contribution for a mono crop cereal and one intercrop combination from each experiment.**

CULTIVARS SEEDING RATES	YIELD kg DM/ha AND N% FOR EACH CULTIVAR	TOTAL DM kg/ha	WHOLE CROP PROTEIN %	TOTAL PROTEIN kg/ha
Maize + Dol Lab Lab 35000/ha 60000/ha	13853 + 3008 (1.14N%) (2.15N%)	16861	8.3	1394
Maize Only	20538 (1.14N%)	20538	7.1	1462
Maize + Soybeans 36000/ha 55000/ha	10949 + 2529 (1.32N%) (3.22N%)	13478	10.3	1388
Alternate Rows Maize Only 72000/ha	17906 (1.22N%)	17906	7.5	1343
Oats + Peas 60kg/ha 136kg/ha	5908 + 622 (.91N%) (2.82N%)	6570	6.9	452
Oats Only	7358 (.91N%)	7358	5.7	419

In each case when the opportunity for the legume to grow well was increased by reducing the seeding rate of the grass crop, total dry matter was reduced considerably (18%, 25% and 11%). This gave an increase in whole crop protein content of 17%, 37% and 21%. In each experiment total protein yield (kg/ha) was similar for each treatment irrespective of the combination of seeding rates.

Soybeans had the greatest effect on whole crop protein. Neither Dolichos nor peas produced sufficient DM at a high enough protein content to greatly influence whole crop protein levels.

The inherent DM yield capacity of these leguminous crops is less than 50% of the companion grass crops. Thus despite general compatibility of the species it is difficult for the lower yielding legume to raise whole crop protein. This can only be done by severely reducing total DM production. If fodder quality is of prime importance (for example raising protein from 7.5 to 10.3 with a soybean/maize intercrop) this may be acceptable, otherwise it would be better to produce protein separately (via lucerne or clover) and balance the ration at feeding.