

## Opportunity cropping : a concept for more efficient agriculture in Northern New South Wales

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The growing of two successive crops on the same land in one year (double cropping) can result in more efficient use of climatic resources, land, labour and invested capital. The practice is common in the higher rainfall areas of the eastern half of the United States (1) and may develop in the coastal regions of New South Wales with the expansion of soybeans (M.J. Hughes, pers.comm.).

In the lower and less reliable rainfall areas west of the Great Dividing Range, the majority of cropped land is sown either to wheat or to a wheat/sorghum rotation, resulting in 20 to 30 crops every 30 years. Under these conditions, opportunity rather than double cropping is more likely to succeed where the decision to sow a crop after harvesting the previous crop is governed by the availability of moisture stored in the soil.

In a water balance simulation study, Berndt and White (2) showed that opportunity cropping resulted in more frequent cropping (47 crops in 30 years), higher gross margins, lower runoff and reduced erosion hazard compared with continuous wheat (28 crops in 30 years) in a moderate rainfall (670 mm p.a.) environment in south-eastern Queensland. It was only in a dry environment, with rainfall of about 500 mm, that continuous wheat produced higher gross margins than opportunity cropping. More recently, Doughton & Mackenzie (3) suggested that mungbean could be sown directly into stubble from a recently harvested wheat crop provided that soil moisture was adequate. The added advantage of following a cereal with a legume is that nitrogen fixation by the legume will be stimulated in the nitrate depleted soil, providing not only nitrogen for its own growth but enriching the soil *via* the crop residues. This may be critical in the north west of New South Wales where previous studies have shown nitrogen to be a major limitation to cereal growth (4).

An example of the potential benefits of opportunity cropping is presented in Table 1. Six species of summer crop were sown in December, 1983, following a 12 month fallow (no-tillage or cultivated) or wheat harvested three weeks previously (see Herridge & Holland, this volume, for details). Gross return for the wheat-soybean double crop was 40 and 601 higher than for the no-tillage and cultivated fallow systems respectively. Rainfall was above average during 1983 and the early part of 1984 resulting in excellent crop growth and yields. These data, however, do support the concept of opportunity cropping and data from experiments in other years, combined with moisture modelling studies, should provide a realistic picture of the likelihood of long-term economic benefits from such a system.

**Table 1. Mean yield of two soybean varieties (Wic 36 and Forrest), wheat yield and gross returns.**

Cropping system	1983 wheat yield	Mean soybean yield 1983/84	Gross return <sup>1</sup>
	t/ha		\$/ha
No-tillage fallow	-	3.15	945
Cultivated fallow	-	2.75	825
Double crop	4.50	2.63	1284

<sup>1</sup>Wheat valued at \$110/t, soybean at \$300/t on farm.

1. Touchton, J.T. and Johnson, J.W. 1982. *Agron. J.* 74, 57-9.
2. Berndt, R.D. and White, B.J. 1976. *Agric. Met.* 16, 221-9.
3. Doughton, J.A. and Mackenzie, J. 1984. *Aust. J. Exp. Agric. Anim. Hush.* 24, 244-9.
4. Doyle, A.D. 1977. N.S.W. Dept. Ag. Tech. Bull. 14.

