# GREEN MANURING
# - A BETTER WAY TO FALLOW?

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## Introduction

Green Manuring is defined as the growing of a crop for the specific purpose of turning it in during the spring to increase the soils organic matter content. If a legume is used as the green manure the added benefit is from the nitrogen fixed by the rhizobium associated with the legume. It is an age old form of ley farming and may well make a reappearance over the next few years. Farmers who have tried a few paddocks of green manure are convinced that the benefits are there for the following wheat crop, both in terms of yield as well as in protein. But as in most systems, the green manure needs to be well managed and the timing of turning it in depends on the season.

*Green Manure Type*

It is not absolutely clear, but the current evidence is that it doesn't matter which crop type is used. The amount of nitrogen fixed by a legume crop is more related to the inherent nitrogen status of the soil and the dry matter produced by the legume crop rather than the crop type. Thus on a paddock low in soil Nitrogen, and that is, presumably, why it is being green manured, the crop type does not matter so much. Vetch is a prolific grower and seed is cheap (around $165/tonne) and is an excellent choice for green manuring. However, many farmers are reluctant to introduce another weed (ie. tares) on the farm, but remember vetches such as Blanchfleur and Languedoc are much less hard seeded compared to tares. In addition, Lontrel (80 to 100 ml/ha) at a reasonable cost, will control vetch quite well in cereals. Second choice, but more expensive, are medics, followed by beans, peas and lupins (especially the older varieties such as Uniharvest). At the Birchip Cropping Demonstration Sites we will be investigating, in 1994, some other type of legumes for their dry matter production and suitability as a green manure.

*Sowing Rates and Times*

Dry matter production is critical, therefore sowing early is essential!

Suggested sowing rates are:

Vetch - 30 to 35 kg/ha
Medics - 15 to 20 kg/ha
Peas and Beans - 100 to 120 kg/ha
Lupins - 80 to 100 kg/ha

*Inoculation*

Since you are after as much Nitrogen fixation as possible the legume to be sown should be inoculated with the right strain of Rhizobium (see paper 'Legume Inoculants & Nodulation' by Greg Bender).

*Weed and Insect Control*

Weed control is an essential component of fallowing and this applies equally to green manuring. Grass weeds will carry over root diseases such as Take-all and CCN, so pre-emergent weed control with Treflan is important (also see paper 'Vetch in the Mallee' by Jay Cummins).

Red Legged Earthmite control is as important in a green manure legume crop as it is in a normal pasture or grain legume crop!

*When is the right time to turn the crop into green manure?*

There is no easy answer to this question. The optimum time to turn a crop into a green manure, in a normal year, is at the early podding stage of the legume crop. However, the conditions of that year are critical in that decision. In a dry, late winter - early spring period, it is important to turn the crop in earlier, otherwise you start to lose the benefits of soil water conservation over the fallow period. In a wet late winter and spring, the opportunity exists to graze the green manure crop quite heavily or even cutting it for hay - putting dollars directly into you pocket.

*What are the benefits of turning in a green manure crop rather than spray fallowing it?*

Significant losses of nitrogen through volatilisation can occur if the green manure is sprayed out and left standing. Nitrogen volatilisation when the green manure is cultivated is negligible.

**Green Manure Trial Results**

We are not aware of any trial work in Victoria dealing with green manuring in 1993. However, the South Australian Department of Primary Industries did undertake some trial work in the South Australian Mallee looking at the responses of previous crop or pasture type on wheat yield and protein. The work was undertaken at Lameroo in the South Australian Mallee. The site was characterised by a sandy loam soil type, organic carbon content of 0.6%, and a soil phosphorus level of 25 ppm (Colwell test). Average annual rainfall at Lameroo is 375 mm.

The Lameroo Wheat Protein Trials consisted of growing wheat across a series of crop and pasture types established in 1992. The treatments in 1992 were Galleon Barley, grass pasture (ryegrass dominant), Blanchfleur Vetch as green manure, Blanchfleur Vetch harvested for grain and sown medic pasture.

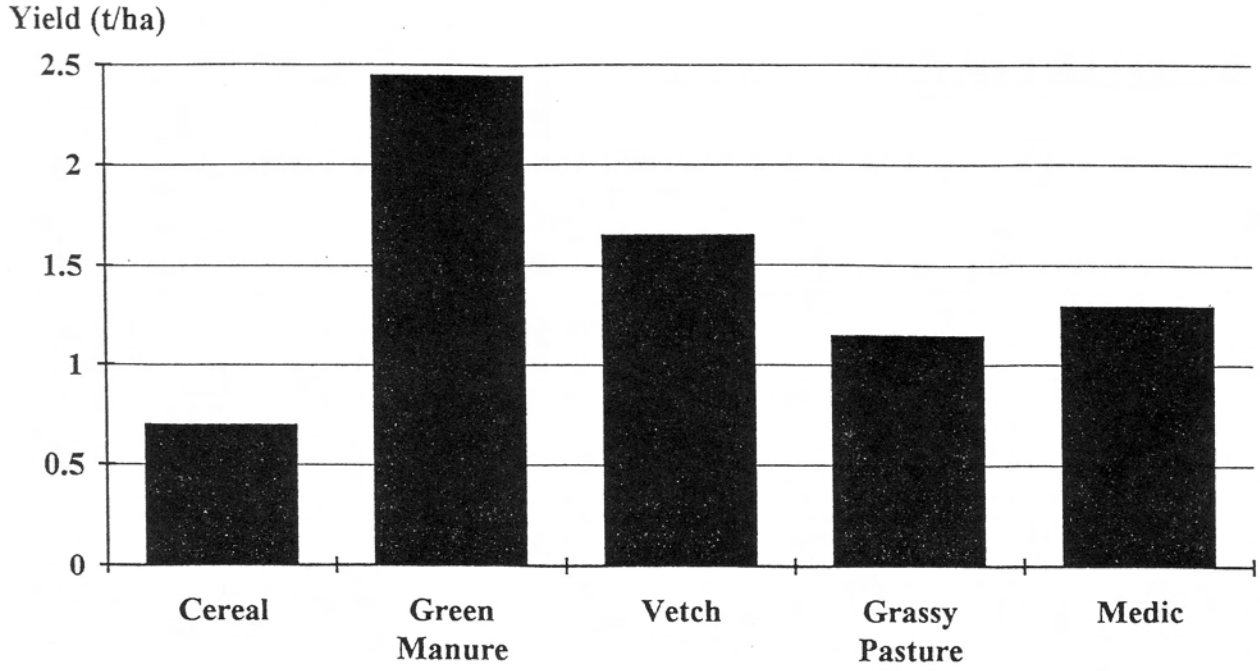


**Figure 1. Grain yields in relation to previous crop or pasture type**

Significant responses were obtained between all treatments, with grain yield ranging from 0.7 t/ha for wheat following barley, to 2.5 t/ha on the green manure plots.

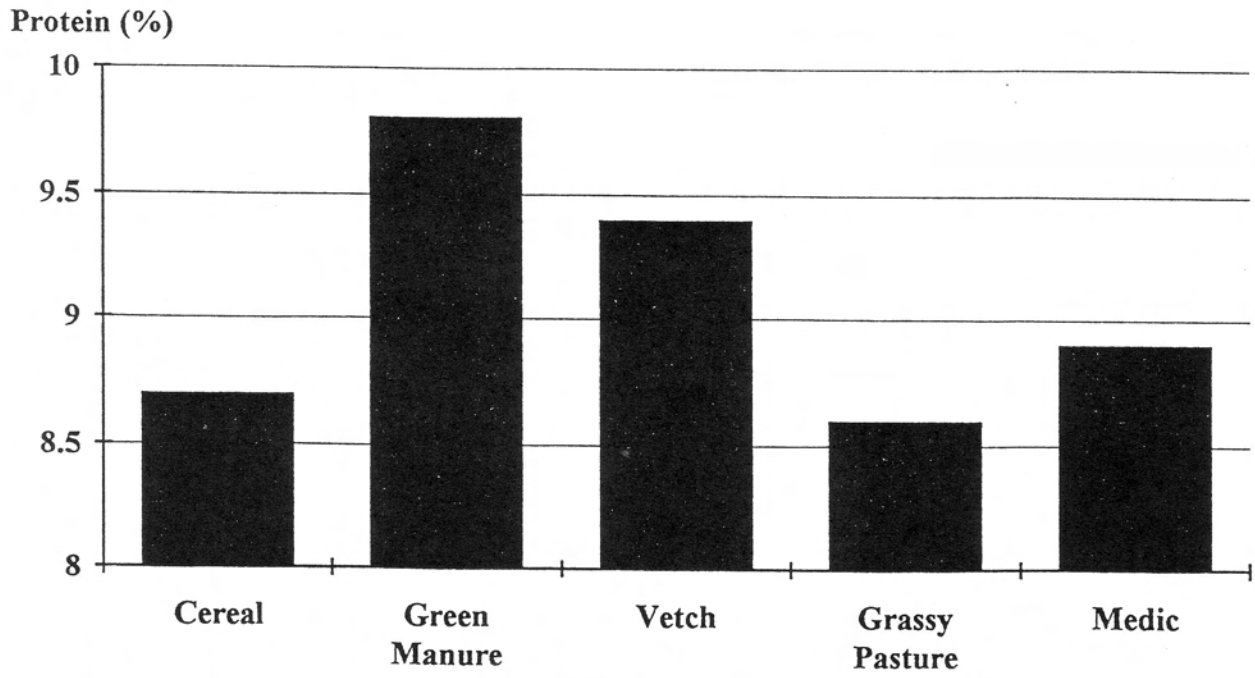


**Figure 2. Grain protein (%) in relation to previous crop or pasture type**

Grassy pasture in 1992 produced the lowest grain protein (8.6%) in 1993, whilst green manure vetch produced the highest grain protein (9.8%).

The response of the wheat to medic in 1992 was considered to be disappointing. The comment was made that the medic in 1992 did not produce as well as it should which may have been due to slightly acidic nature of the soil (pH of 6.5%) which caused some problems with nodulation.

*Editor's note:* the data on green manuring was supplied by Jay Cummins from the South Australian Department of Primary Industries, Lameroo.

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**REMEMBER: BCDS Field Day - 14 September**