White clover seed production without irrigation

N. Q. WRIGHT
Annat, Sheffield

ABSTRACT. The key to large-scale white clover seed production in this environment is **(1)** the use of herbicides for grass and weed control; (2) the use of defoliants at harvest; (3) a crop programme which enables the harvest to be spread over a longer period, thus giving time in the crucial hottest part of the summer to harvest the bulk of the clover.

Key words: *Trifolium repens*, seed production, dryland farming.

INTRODUCTION

I farm 567 ha in the Sheffield district in partnership with my brother. The farm is situated in the rain shadow of the Southern Alps at an altitude of approximately 300 m, with an annual rainfall of 940 mm.

METHODS

Apart from the cash return generated by white clover (*Trifolium repens* L.) seed production, the presence of the species in the rotation helps to maintain high yields from other crops without the need for much additional fertilizer nitrogen. White clover usually follows wheat or 'Grasslands Manawa' ryegrass (*Lolium* × *hybridum* Hausskn.) in our rotation, with most paddocks being in clover one year in four.

'Grasslands Huia' white clover is either sown at 3.4 kg/ha with ryegrass in February/March or broadcast on wheat crops in September. Broadcast sowings are carried out with the Cambridge roller followed by sowing and light harrowing, or from a fertilizer spreader with harrows attached. The majority of wheat crops (121 ha) are treated in this way, but, regardless of the method of sowing, all seed crops are taken in the second summer.

After the wheat is harvested, 440 kg/ha of molybdenized superphosphate is topdressed on to all potential clover paddocks in March. The paddocks are then lightly grazed by large mobs of sheep throughout the autumn to encourage the breakdown of stubble. All stock are then removed in early winter to encourage clover growth at this stage.

In early July up to 200 ha of potential clover crop is assessed and all paddocks with a plant density of $10/m^2$ or more are retained. The remainder go to **pea** production (40 ha) ***or*** to barley, of which up to 60 ha is grown in most years. Overall, the best results in clover establishment have been gained when undersown with wheat or garden peas. On average, 30% of the area sown to clover is discarded each year owing to poor establishment.

If required, paddocks are sprayed **in** July with propyzamide for grass control, and with 2, 4-DB for flatweeds in August. All paddocks are heavy rolled in late winter/early spring to aid harvesting.

During spring the areas are lightly grazed by sheep, of which over 3700 are wintered on the farm. In the third week of October the sheep are moved to a hill-country block or to other grazing and the crops are finally classed for seed production. If at this stage there is adverse dry weather and crops are not up to standard on all or parts of the field, there is still time to cultivate for pea production without affecting the future crop rotation of the paddock.

Any paddocks that have a thistle problem are sprayed at this stage. A close watch is kept for the blue-green aphid during the months of October and November, and if the population builds up, spraying is done as required.

The whole cropping programme is geared so that we commence in early January with ryegrass harvest followed by the white clover, which usually starts in the third week of January.

TABLE 1: GROSS MARGIN ANALYSIS OF WHITE CLOVER SEED PRODUCTION
(per hectare)

	$ c
Sowing expenses	59.30
Weed and pest control	107.47
Heavy roiling	4.38
Harvesting	56.30
Post-harvest dressing	65.11
Cartage box hire	
Repairs and maintenance	
Interest and depreciation	11.87
	304.43
Income. 336 kg/ha	487.20
Net profit	182.77
Plus grazing	86.66
	$269.43

The key to large-scale white clover production has been the regular use of a defoliant spray (diquat) which enables harvesting to be done some two days after spraying. Considerable thought has been put into mowing of the crop, and our present method is to windrow all crops and thus avoid loss of yield through the thrashing effect of turbo-type mowers. Combines are fitted with Murphy pick-up attachments which enable all loose heads to be thrashed, and also combining can be carried out in very windy conditions. This enables maximum use to be made of all the fine dry harvesting days and nights that are available.

GROSS MARGINS

I have attempted in this paper to give a summary of the physical operations in growing white clover under dryland farming, but the story is not complete without a detailed gross margin analysis of the operation, compiled in conjunction with N. J. Beattie, MAF, Darfield (Table 1).

This table highlights the fact that the high input costs of sprays (in particular), fertilizer and seed dressing mean that white clover seed production is now a high-cost cropping enterprise. However, this must be judged in relation to the effect that white clover production has on maintaining and improving crop yields on the rest of our farming operation.