OILSEED RAPE - AGRONOMIC EXPERIENCES, PROBLEMS AND POTENTIAL

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ABSTRACT

Oilseed Rape **(Brassica napus.** L. variety 'TOWER') is now being commercially grown by Fletcher Agriculture in the South Island. Farmers experiences, successes and problems are analysed. The regional variations in soil types, climatic conditions, weed and pest levels, have a significant effect on yields. This has required a variety of managerial skills to be developed. Regional potential is analysed and the place of Oilseed Rape within the cropping programme is discussed.

INTRODUCTION

Fodder rape crops have been grown throughout New Zealand in past years solely for animal feed and it has only been in the last three or four years that the possibility of growing oilseed rape for edible oil production has been realised.

Following the development of the 'double zero' oilseed rape variety 'TOWER' **(Brassica napus.** L.) a new opportunity has opened up for farmers in the South Island to grow an alternative crop. In the case of the Southland farmer, who has little opportunity to grow alternative crops to his cereals, oilseed rape offers the opportunity of growing a viable alternative, providing the basic management techniques required are adhered to.

Because of the future seed volume requirements demanded by the project, there is a need to establish a reliable seed supply from a wider growing area, hence our recent expansion into Canterbury.

Commercial Development

The first commercial growing of 'TOWER' rapeseed was undertaken by Fletcher Agriculture in the 1974/75 season with the establishment of 511 hectares in Canterbury, Otago and Southland.

The Southland crops performed well, but the Canterbury/North Otago regions were disappointing and the need arose to monitor closely the management of the crop if confidence in oilseed rape was to be established with growers in these regions. Consequently in 1975/76 the commercial development of the crop was more concentrated in Canterbury although the Southland region was given the opportunity to maintain their involvement with the crop.

To ensure that the 1975/76 season was more successful (particularly in Canterbury) a move was made by the Company to select only those growers who were better equipped from a managerial and machinery point of view. In conjunction with this initial grower selection, intensive servicing was carried out to ensure that our recommendations were put into practice and that the day to day management of the crop was upgraded.

The comparatively small area of oilseed rape currently grown, does not at this stage attract the attention of all cropping farmers and there is some resistance by both Commercial firms and Government Research Agencies to recognise the need for assistance with trial work and the related assessment work which the developing crop requires. Our experience band is affected by the range of growing areas that the crop is likely to be grown in and there is a general lack of information on how it may perform under differing climatic conditions and soil types.

Farmer Experience

The better yielding crops (in excess of 1800 kg/ha) have been grown by farmers displaying sound managerial skill. In most cases they have followed the basic guidelines in paddock selection, adequate fertiliser inputs, and good weed and pest control.

Sowing rates have varied between 3.5 - 5.6 kg/ha with the lower rates being more desirable on heavier soil types. Higher sowing rates on heavier soil types tend to lead to a greater incidence of lodging. The "TOWER' variety is prone to lodging.

The general fertiliser recommendation has been 250 kg/ha of ammonium sulphate and 250 kg/ha of reverted super applied at sowing, giving a total of 52.5 kg N, 17.5 kg P and 80 kg S per hectare.

The major influences on yield have been the degree of weed infestation and the relatively high incidence of aphid, (particularly **Brevicoryne brassicae)** most serious during the flowering period in Canterbury and North Otago crops.

(a) Weed control - the most effective method of weed control has been the application of pre-emergent herbicides such as Trifluralin at .84 - 1.12 kg/ha a.i. To date only two chemicals are fully registered for weed control in oilseed rape - Dicamba and Trifluralin - however, there is a real need for a broad spectrum post-emergent herbicide to be developed for use in this crop and many Commercial Agricultural Chemical Companies are currently involved in this project. Although a number of chemicals are registered for use in brassicas, these are not suited to oilseed rape and in some instances herbicide damage and yield reduction has resulted where they have been used.

Trifluralin has shown good control of Fathen **(Chenopodium album)**; Spurrey **(Spergula arvensis)**; Willow Seed **(Polygonum persicaria)** and

Cornbind **(Polygonum convolvulus)** however, there is a need to control other weed species such as Californian Thistle **(Cirsium arvense)** and Shepherds Purse **(Capsulla bursapastoris)**, the latter being a strong competitor where crop establishment is slow.

(b) Pest control - there seemed to be much damage occuring during crop establishment which appeared initially to be Springtail (Bourletiella species), but later investigation has shown that some of these weaker developing crops were effected by the fungus diseases **Rhizoctonia solani** and **Pythium.** The very cold weather experienced in the Spring of 1975 produced ideal conditions for the occurrence of **Rhizoctonia solani** and there is a need to investigate a combination of seed treatments to reduce this fungus problem in the future.

The major influence on yields in Canterbury and North Otago has been the effect of aphids. To counteract this problem we have recommended the application of a granular insecticide such as Disulfoton at 1 - 1.5 kg/ha a.i. at sowing. The control level is maintained for 10-12 weeks but thereafter tends to be a major fall off in protection and aphid numbers correspondingly increase. (Figure 1).

The restriction on the use of pesticides in brassica crops, i.e. the Apiary Act 1969, proves a problem for the control of aphids in flowering oilseed rape crops. In all cases farmers have been unable to obtain a permit to control aphids during this period and it is further compounded by the complete absence of any chemical registered for aphid control in oilseed rape.

The oilseed rape crop will flower for between four and eight weeks, and if aphid infestation occurs in the early stages of flowering, yield reductions can be severe. The only available methods of control have been to apply a granular insecticide at sowing and/or spraying just prior to or directly after flowering, should the need arise. The inability to control aphids during the flowering period undermines the confidence farmers have in growing oilseed rape and this problem requires intensive investigation and resolution.

Crops under irrigation have responded well with good yields being obtained in Canterbury. The most marked response has been found with a watering at the commencement of flowering with lesser responses evident with later applications.

The importance of 'Timing' in the harvesting operation has been understood by growers from the outset and the correct determination of the optimum windrowing time is important to ensure that seed loss is minimised and seed quality is maximised. Windrowing ensures even ripening, more rapid drying and reduces the risk of shattering. The optimum time to windrow appears to be when 25-30% of all the seed in the crop have turned from green to brown. At this stage most of the seed in the lower pods of the plants would have turned colour, while the pods located further up the plant are still quite green. To the observer this is approximately when birds (particularly members of the finch family) show a strong interest in the crop.

If weather conditions are hot (i.e. under north westerly wind conditions in Canterbury) the higher percentage of brown seed is desirable before windrowing, to ensure that the seed does not shrivel. The Southland farmer can windrow much earlier than his Canterbury counterpart, because of the cooler drying temperatures experienced.

Most growers find the harvesting operation straight forward. A low drum speed, a round-holded riddle and a medium-wind blast gives a good field dressed sample. The past two seasons have been harvested into bags at 12% moisture but for the 1976/77 season we are moving to bulk handling and moisture levels will be reduced to 10% for safe storage.

Post-Harvest Management

Following the harvest we recommend that farmers heavily stock their paddocks to encourage any unharvested seed to germinate prior to the cultivation for the following crop. There is concern amongst growers that any seed remaining will pose a problem in future years similar to that posed by 'wild turnip'. To reduce this risk ploughing directly after harvest is not recommended. Some growers are direct drilling barley into the rape stubble for winter grazing thus reducing the need to cultivate. The natural trampling of stock will further increase the post-harvest strike of rapeseed reducing the potential problem even further.

Place in Rotation

One of the major considerations when growing oilseed rape is to ensure that seed purity is maintained and possible contamination with other types of brassica are avoided. Furthermore oilseed rape is subject to brassica type diseases such as clubroot and should not be grown in paddocks having previously grown other brassica crops for at least three years or more.

In Southalnd where wild turnip **(Brassica campestris)** is prevalent, in many crops directly out of lea, to avoid contamination it is unwise to grow oilseed rape early in the rotation. It is anticipated that oilseed rape will follow a cereal and will become established as a break crop between cereals in the Southland region. This will give farmers effective weed control within their cropping rotation as cereals and oilseed rape both require selective weed control.

Within Canterbury and North Otago the situation is somewhat different with a more intensive cropping rotation being followed. Again rapeseed should develop as a break crop, though many farmers are showing a strong interest in growing rapeseed after a white clover seed crop where the nitrogen buildup can be utilised.

Regional Experiences and Potential

The Southland region has already grown crops in excess of 2400 kg/ha with a top yield of 3600 kg/ha of F.D. oilseed rape already recorded.

The higher yields are being obtained on the heavier soils where reliable rainfall or soil moisture retention is experienced over the December-January period. It is hoped the Southland region will increase the limited acreage being grown at present, to a possible total of 4000 hectares.

In the Canterbury/North Otago region there is considerable interst in oilseed rape and there has been a good response this year from farmers wishing to grow an increased area. In North Otago the increase in the available irrigated land has effected a corresponding increase in interest in more cropping,

TABLE 1: Hectares sown and average yields (F.D. Basis).

Region	1974/75 Ha	1974/75 Kg	1975/76 Ha	1975/76 Kg	1975/76 Intended ha
North of Rakaia River	81	206	9	2295	30
Mid Canterbury (Ashburton County)	71	643	65	1839	110
South Canterbury					
– Strathallan County	124	1120	104	1841	160
– Waimate County	17	1059	22	3062	50
North Otago	41	935	37	1698	150
Southland					
– West Otago - centred on Kelso	24	1566	6	2168	40
– Gore - Balfour region	88	1381	30	1581	130
– Invercargill - Winton - Otautau	53	2038	36	2011	130

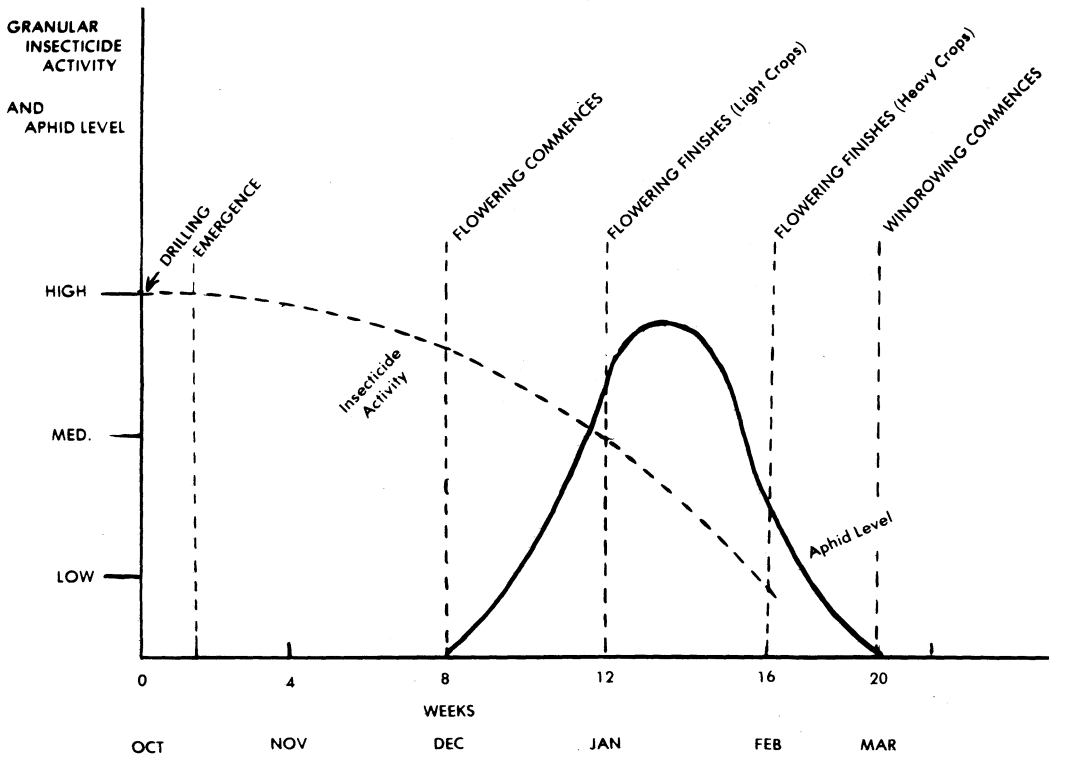

FIG. 1: A diagrammatical illustration of the growth stages of Oilseed Rape and the level of Activity of Granular Insecticides (1975/76).

and oilseed rape has been shown to yield 2400 kg/ha plus in this region (Table 1)

Within Canterbury, heavier soils under irrigation are producing 2400 kg/ha crops, with the heavier soils exceeding this yeild without irrigation. The highest yield of 3600 kg/ha in 1975/76 was achieved in the Waimate area with no irrigation on a heavier soil type.

Some farmers under good management are achieving yields in excess of 2400 kg/ha on lighter soils with irrigation and on some of these soils oilseed rape is providing a better margin than wheat. However many of the traditional cropping farmers have yet to experience the growing of oilseed rape and it is this group that we hope will form the nucleus of growers to substantially increase the present area grown in the Canterbury and North Otago regions. The potential for this region is 8000 hectares of oilseed rape which will be needed to satisfy a growing demand in New Zealand for edible oils.

CONCLUSION

The past two seasons have seen a marked increase in the experience of farmers in growing oilseed rape. There is no doubt that good managerial skill and attention to detail has resulted in good returns to them but there is a need for further research and development to ensure that we consolidate the current position.

Oilseed rape can be grown successfully, but because of a high establishment cost farmers class it as a high risk crop. To date the greatest single influence on yield has been the relative inexperience of farmers in growing this new crop. We still have many questions to answer to understand fully the complexities of growing oilseed rape in New Zealand, and is desirable that agronomists and related agriculturalists become involved in assisting us to answer many of the questions that affect the crop from nutrient, weed and pest control, water requirement stand point, right through to the solving of the phenomenon which resulted in large numbers of seed aborting in the early development of the seed in the pod. In the past two seasons this latter problem alone resulted in yield reductions of up to 30% in some crops.