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# RAPESEED PRODUCTION IN WESTERN AUSTRALIA

By M. L. POOLE, Research Officer, Plant Research Division

RAPESEED production began in Western Australia in 1968 when a few acres were grown. In 1969, about 20 growers planted small acreages for about 80 tons of seed. In 1970, up to 20,000 acres will be grown, and a total of 40,000 acres seems possible within the next few years.

New crops often bring problems which may be overcome if the lessons learned in other countries are heeded. This article sets out some "do's" and "don't's" of growing rape. The recommendations are provisional, and will be reviewed as more information becomes available.

## Background

Rapes belong to the genus *Brassica*, which includes common plants such as the garden cabbage, wild turnip and the cultivated mustard. In the world oilseeds trade, rapeseed is the general name given to seed from a number of true rape and closely related species such as the turnip rapes and mustards.

Two types of rapeseed are most likely to be suitable under Western Australian conditions. These are—

- Summer rape, *Brassica napus* var. *oleifera* sub var. *annua*. Target is the currently grown cultivar.
- Summer turnip rape, *Brassica campestris* var. *oleifera* sub var. *annua*. Arlo and Echo are examples of this type.

Modern rape varieties produce small brownish-black seeds about the size of a subterranean clover seed. The seeds contain 40 to 45 per cent. oil which is used for salad oil and margarine manufacture and a wide variety of industrial purposes. The by-product meal is a high protein stock supplement.

Wild turnip (*Brassica tournefortii*) has occasionally been harvested for oilseed in W.A. but has only a 23 per cent. oil content

and is thus inferior to the cultivated rapes in spite of the fact that it is almost indistinguishable from them when mature.

Average 1969 yields for rape in the Esperance region ranged from 500 to 750 lb. seed per acre. The top yield was 900 lb. per acre from a crop of Target.

## Pollination

The summer turnip rapes (Arlo type) are completely cross-pollinating and depend on wind and insects to achieve pollination. The true rapes (Target type) are about one-third cross-pollinating and two-thirds self-pollinating.

The degree of cross pollination means that rape, turnip rape and wild turnip can interbreed and thus make it difficult to produce pure line mother seed for each variety. Overseas, pure line seed is obtained by separating the different varieties by at least 400 yards. Farmers growing seed for future plantings should also do this to ensure the maintenance of high quality seed.

## Climate, soil and fertility requirements of rape

There is little specific information on the best climatic and soil conditions for rape growing in W.A. but the following general requirements are likely to apply.

### Climate

So far in W.A. rape has performed best in southern regions receiving more than 17 in. annual rainfall—approximately the area where linseed grows well. However



rape does appear to be more resistant to dry conditions than current linseed varieties and may eventually find a place in the medium rainfall cereal growing areas.

It should be stressed that there is little information on the adaptability of rape to Western Australian climatic conditions and farmers in drier areas should only try small plantings at first. West coastal regions between Perth and Geraldton may be suitable for rape production.

#### **Soil**

Rape apparently has no specific soil requirements but heavy structureless clays, areas prone to waterlogging, and deep sandy soils should be avoided. The best soil types are probably those recommended for linseed—well drained loams and sandy surface soils with gravel or clay within 9 in. of the surface.

#### **Fertility**

Rape is likely to yield best on paddocks that have been under clover for three or four years. Experience with new land rape crops has not been wide enough to recommend other than small scale trial areas.

#### **Varieties of rape\***

Two varieties of rape are now available in reasonable quantities; Arlo—a turnip rape, and Target—a true rape.

The turnip rapes often have slightly lower yields and oil content when grown overseas but so far this difference has not been seen in W.A. In W.A. Target grows to about four feet and Arlo to three feet.

Arlo does mature two or three weeks earlier than Target and thus may be better suited to lower rainfall areas. Target should thus be planted first when both cultivars are being grown.

Arlo is supposed to be more frost resistant than Target and under overseas conditions does not shed as readily. The cultivar Echo, a turnip rape that has yielded well in trials, may be available in small quantities. Dwarf Essex, a cultivar which has been grown in this State for many years as a fodder crop is *not* suitable for rapeseed production because of its low yield and oil content.

\* The Department of Agriculture does *not* have seed supplies of any of these varieties and farmers should make enquiries about seed supplies to oilseed processing firms or stock agents.

#### **Sowing rape**

Rapeseed crops should be sown as early as possible after good weed control has been obtained, at a rate of 5 to 8 lb. per acre. The higher rate should be used if weeds are likely to be a problem later in the season.

As most drills cannot sow such low rates accurately through the grain box, seed should be sown either through a small seeds attachment, or mixed with superphosphate through the fertiliser box.

Rapeseed is small and should not be sown more than half an inch deep. When using a disc drill with small seeds a common practice is to have the discs cultivating lightly and the fertiliser tubes removed from their boots. This allows the seed and fertiliser to be dropped onto the soil surface where they are buried with trailing harrows.

Whether a disc drill or combine is used, the depth of sowing should be checked to see that seed is not buried too deeply. If a combine is used, the back tynes must not be set too deeply.

#### **Fertilisers**

There is little information on the fertiliser requirements of rapeseed crops grown in W.A.; farmers are therefore recommended to grow rapeseed on soils of reasonable fertility. Soils which have grown good sub. clover pastures for at least three years and have had several annual applications of superphosphate should be suitable.

Superphosphate, nitrogen (or compound fertilisers) and trace elements, should be applied with the crop in accordance with soil type and paddock history using rates recommended for linseed crops. Department of Agriculture District Advisers can help with fertiliser recommendations.

#### **Weed control**

Because of its small seeds and seedlings rape competes poorly against weeds in the first few weeks of growth. Later however, as it forms a rosette of leaves around the base of the plant, it is able to compete well with most weeds.

Practices which give good weed control in linseed crops apply equally well to rapeseed production. Some points to watch are discussed below.



### *Grazing management*

Continuous grazing at a high stocking rate in the previous spring will help prevent the seed set of Wimmera ryegrass and other grasses. This also reduces the surface litter and seed over summer and autumn, and improves conditions for germination of grass seeds. Ploughing is also more effective on clean ground.

Alternatively, if there is ample feed for stock in other paddocks, and where there is enough dry matter or stubble to carry a fire, it is good practice to burn before cropping.

### *Cultivation*

A disc plough is the best implement to bury green material although, depending on the efficiency with which pasture is turned or killed, it may be necessary to replough or scarify 10 to 14 days later, just before planting.

Whatever the implement used the aim with weed control under wet conditions should be:

- Heavily graze pastures up to the time of planting.
- Completely bury all green living material.
- Stop this material returning to the surface before it is dead.

Where a late germination of grass seeds is not expected but a second cultivation is necessary before the buried weeds are dead, the second operation should be shallow.

### *Do not spray with hormone herbicides*

Like wild turnip, rape is extremely susceptible to 2,4-D and MCPA type herbicides and therefore cannot be sprayed with these herbicides. Great care should be taken that such chemicals do not drift onto a rape crop from nearby areas.

Wild turnip should not be allowed to contaminate rape crops, as the presence of its seeds in a rapeseed consignment will lower the average oil content and reduce returns.

### *Late Germination of weed seeds*

Late germinating Wimmera ryegrass is a common problem in cereal and linseed crops. Rape may have a unique advantage here as its heavy rosette of leaves apparently smothers the ryegrass seedlings.

### **Insect Control**

#### *Red legged earth mite*

Red legged earth mite causes damage to rape during seedling emergence. It is essential that all crops be sprayed within seven days of planting, before the seedlings emerge.

Where red legged earth mite is likely to cause trouble, 4 oz. of D.D.T.\* active ingredient is required per acre. If light insect populations are expected the rate can be lowered to 2 to 3 oz. D.D.T. active ingredient per acre.

Systemic insecticides are ineffective on bare soil, and it could be dangerous to wait for the seedlings to emerge before controlling red legged earth mite with this type of material.

Spraying the boundaries of neighbouring clover paddocks with an insecticide such as Imidan or Dimethoate (Rogor) will help prevent the movement of red legged earth mite from pasture into rape-seed crops.

#### *Native budworm (climbing cutworm)*

The native budworm moth is active in the growing crop during spring, and the caterpillars may be present during and soon after flowering. Growers should inspect crops frequently after the first sign of activity. The following points should be remembered:

- Moths lay eggs singly on the foliage of host plants and hatching occurs from two to eight days later.
- Experience has shown that spray is warranted whenever one or two caterpillars are found per square yard of the crop. Thorough inspection is required to determine such low population densities.
- If D.D.T. is sprayed when the budworms are less than 1 in. long, 8 oz. D.D.T. active ingredient per acre is suggested (1 3/5 pints 25 per cent. D.D.T. per acre). If cutworms are longer than 1 in. 2 2/5 pints to 3 1/5 pints of 25 per cent. D.D.T. per acre should be used depending on whether the

\* D.D.T. should not be used in established dairy pastures, or where animals are being finished for slaughter.



budworms are approaching full maturity or have reached the mature stage.

As the possibility of a second infestation cannot be predicted, regular inspections must be made over an extended period.

The residual effect of D.D.T. is 7 to 14 days but new plant growth after spraying will not benefit from the residual effect. Some farmers use a mister and utility to control budworm infestations and cause little damage to crops.

### *Aphids*

Aphids have caused trouble in isolated instances and heavy infestations should be sprayed with Demeton-methyl (Metasystox) at 8 oz. of 25 per cent. active ingredient per acre.

### **Disease**

Diseases have caused no trouble, but some may be encountered as areas under rapeseed are increased. Farmers are urged to forward crop samples suspected of being diseased to the Department of Agriculture immediately.

### **Grazing**

Because grazing will seriously reduce yield, rape crops grown for seed should not be grazed at any stage. However, sheep readily eat the stubbles, which can be grazed immediately after harvest.

Rape is widely grown as a fodder crop overseas to provide early feed. Self-sown or abandoned crops can be grazed with safety during the green stage.

### **Successive cropping**

There is no apparent reason why an area should not be successively cropped to rape, particularly if it has been under clover ley for several years. Farmers may be tempted to allow self-sown crops to re-establish but until more information becomes available this cannot be recommended, and proper re-seeding with clean seed, extra nitrogen according to recommendations for successive crops, good weed control, etc., is advisable.

### **Rape as a crop weed**

Because rape is similar to wild turnip, self-sown rape may cause problems in

future cereal crops. Rape can be controlled with 2,4-D type herbicides.

### **Harvesting**

Rapeseed harvesting can be a critical operation because of the danger of excessive shedding. However, it appears that shedding can be almost eliminated under W.A. conditions, and a clean sample obtained, if the following precautions are taken:

#### *Growth stage at harvest*

Although the stems will still be partly green, rape should be harvested as soon as all pods are dry and the seeds are a brownish black colour. However, as the pods ripen from the top of the rape plant downwards, it may be difficult to avoid the loss of a few of the top pods. Green pods pass through the harvester unthreshed but if the top pods start shedding excessively, the crop should be harvested immediately.

On patchy soils some areas of the crop may mature before others. There is no way to avoid this and farmers must judge when is the best time to take off the crop with minimum loss.

#### *Weather conditions*

Because of the danger of shattering, rape seed should be harvested early in the morning, or in the evening, or on overcast, humid days. Hot, dry conditions should be avoided.

#### *Machine setting*

Because of the large bulk of stalk material produced by a rape crop, and the tendency of the pods to shatter during harvest, open-front machines generally give greater seed recovery than closed-front types. However, the crop can be harvested with closed-front machines, and some operators have achieved best results by adjusting comb spacings to half an inch.

With open-front machines it may be necessary to adjust reel speed according to the density of the crop.

Rape threshes easily and as the seeds are light and liable to cracking, attention to detail is important if maximum recovery and a clean sample are to be obtained.



Some typical settings which have given good results are:

- Drum speed—450 to 800 revs/min. (i.e., as low as possible).
- Concave clearance— $\frac{1}{2}$  to  $1\frac{1}{2}$  inches.
- Sieves— $\frac{1}{2}$  in. lip riddle at top— $1/8$  or  $3/32$  in. round hole riddle at bottom.
- Draught— $\frac{1}{4}$  to  $\frac{1}{2}$  open.

Most operators have obtained clean seed by taking seed through the rotary screens into the seconds box. Where large crops are being handled, larger seconds boxes may be necessary. Alternatively, the rotary screens can be blanked off.

*The fineness of some of these adjustments cannot be stressed too much and operators may have to spend considerable time testing for the best combination.*

### Grain receival standards

The standards set by RefinOil Pty. Ltd. (the main local buyer of rapeseed), and which will probably be asked by Japanese buyers should they enter the market, conform approximately to the following Canadian Rapeseed Standard No. 1.

- Moisture content—8 per cent. or less. (Dockage at 2 per cent. of contract price for each 1 per cent. of moisture over 8 per cent. Seed with more than 10 per cent. moisture is rejected.)
- Seed purity—98 per cent. (dockage at rate of \$3 per ton for every 1 per cent. below 98 per cent.)
- Oil content—40 per cent. (price received is docked by 2 per cent. of the contract price for every 1 per cent. oil content below 40 per cent. Premiums apply for over 40 per cent. oil).
- Toxic substances—the grain should not be treated with insecticides dangerous to humans or stock, such as D.D.T. dust and organic mercury compounds.

In 1970, the price being paid to contract growers for seed meeting the above standards is \$80 per ton delivered to Perth (Kewdale yards).

Rapeseed grown in W.A. in 1969 achieved these standards in nearly all cases. The main problems were:

- Seed purity—due partly to operator inexperience. When harvesting the crop some dirty samples were obtained but could have been avoided with correct machine setting.
- Oil content—rapeseed usually has more than 40 per cent. content but there is a big danger of the inclusion of substantial quantities of wild turnip seed, which has only 23 per cent. oil. An admixture of 10 per cent. wild turnip seed would reduce the average oil content of the sample to 38.3 per cent. In this case, if the contract price for Canadian Rapeseed Standard No. 1 was \$80 per ton, the grower would receive only about \$77.80.

### Economics

The figures given below are a rough guide to the relative profitability of various crops.

Crop	Bu. weight	Grower return per bushel*	Bushels per acre for equivalent return
	lb.	\$	
Wheat ....	60	1.11	21 (1,260 lb.)
Oats ....	40	0.40	58 (2,320 lb.)
Feed barley ....	50	0.50	46 (2,300 lb.)
Malt barley ....	50	0.90	26 (1,300 lb.)
Linseed ....	56	2.15	11 (672 lb.)
Rapeseed ....	56	1.75	13 (728 lb.)

\* Handling costs and/or freight allowed for when calculating returns.

The cost of production of these crops is likely to be \$6 to \$8 per acre. Rapeseed may cost slightly less than linseed because of its low seeding rate and less critical weed control requirements.

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