

## NOTES ON FOUR CROPTYPES

Harm van Rees

### WHEAT

The prospects for wheat are reasonable this season. We cannot expect any great rise in prices, but the new protein premiums being paid by the AWB mean that wheat of good quality will fetch a good price.

*Which variety should you grow?*

The following points should be considered when deciding which variety you should grow:

1. Choose varieties which come up best in your local variety trial site (Dept. of Agriculture), but consider differences between the trial site and your paddocks: history, establishment techniques and differences in soil type.
2. Consider the protein history of the paddock. Paddocks with low to average protein are not going to improve markedly in 1994 unless you have radically changed the management of the paddock. Choose the variety best suited to the mark you are aiming at. Is it a low protein paddock; are you better off to grow a biscuit wheat?
3. Ensure you have a market for your wheat if you are growing specific wheat destined for a particular market (such as biscuit wheat).
4. Assess the risk of leaf and root diseases in each paddock. Cereal stubble does carry over leaf diseases. If there is a risk of a disease outbreak such as stripe rust, sow a resistant variety. If the paddock has a history of Take-all and the paddock was not grass free in 1993, make the decision as to whether wheat is your best option.
5. Spread the risk of disease or being caught by the weather by having more than one variety available for sowing. In the event of an early break, have a longer season variety such as Rosella on hand so that you can sow at least a couple of paddocks in April. Staggering the flowering period is often a good idea; it will help in preventing a frost wipe-out.
6. If using Trifluralin, make sure that your choice of variety includes those with a long coleoptile. Sowing short coleoptile wheat, pickling the seed and using Trifluralin is asking for trouble! If you are sowing into hard setting soils and if the conditions are not perfect, a longer coleoptile wheat will often establish better.

7. Use good quality seed. Some farmers are using nursery paddocks, in which they use high rates of fertiliser to grow plump grain for seed.

**Table 1. Main attributes of the more commonly used varieties (from Martin and Dykstra 1993)**

Variety	Quality <sup>#</sup>	Relative Maturity	Lodging Resist.	Colcoptile Length
Beulah	AH/ASW	Early	?	65 - 80 mm
Cocamba	AH/ASW	Early	?	80 - 95 mm
Goroke	ASW	3 days > Meering	good	?
Janz	ASW	Early	?	80 - 95 mm
Meering	AH/ASW	Early	good	65 - 80 mm
Ouyen	AH/ASW	2 days > Meering	good	?
Rosella	ASW/N	late	good	80 - 95 mm

# Depends on silo group

**Table 2. Disease susceptibility by variety (from Martin and Dykstra 1993)**

Variety	Stripe Rust <sup>#</sup>	Leaf Rust <sup>#</sup>	Stem Rust <sup>#</sup>	Flag Smut <sup>#</sup>	Septoria <sup>#</sup>	CCN Resistance #	CCN Tolerance *
Beulah	MR	MS	R	MR	MS	R	
Cocamba	R-MR	MR	S	R	MR-MS	MS	MT
Goroke	MR	R	R	R	MS	R	
Janz	MR	R	R	R	MS	S	I
Meering	MR	S	S	R	MR-MS	S	I
Ouyen	MR	S	MS	R	MS	R	
Rosella	R-MR	S	MS	S	MR-MS	S	MI

legend    <sup>#</sup> R = Resistant  
 MR = Moderately Resistant  
 S = Susceptible  
 MS = Moderately Susceptible  
 VS = Very Susceptible

\* T = Tolerant  
 MT = Mod. Tolerant  
 I = Intolerant

### Sowing Rates

Seedling densities are in the range of 110 to 180 plants per m<sup>2</sup> (110 in the < 350 mm, 140 in the 350 - 400 mm and 180 in the 400 - 450 mm annual rainfall zones). Assuming a normal seed size and 80 to 90% viability, these densities are attained with 40 to 60 kg/ha sowing rates.

### *Fertilisers*

A fertiliser plan should be prepared for all paddocks, regardless of crop type to be sown. This plan should include:

1. a cumulative nutrient balance (nutrients added as fertiliser minus nutrients removed in the crop, calculated over at least the previous five years).
2. regular tissue testing to pick up nutrient deficiencies (especially for Phosphorus, Sulphur and Zinc).
3. soil testing for organic Carbon and Phosphorus every five years to ensure the stability of the cropping program.
4. soil testing for available Nitrogen (primarily Nitrate-Nitrogen) prior to sowing.
5. sap testing of cereals and canola for Nitrate during the early growth stages of the season.
6. use of test strips with fertilisers in different paddocks to see whether responses are likely (this is especially useful with Nitrogen fertiliser).

In general, if grain protein contents have been below 11% and yields below 80% of potential Water Use Efficiency, and if weed and disease control is reasonable, then it is likely that the wheat crops have been nitrogen deficient. Depending on the amount of water stored in the soil profile prior to sowing, seasonal conditions and plant establishment, it will be worthwhile to experiment with a Nitrogen based fertiliser.

Remember that a wheat crop removes around 3 kg of phosphorus per tonne of grain. Thus, if you have had a couple years of good yields, then it is highly likely that the phosphorus bank in the soil has been run down. It needs to be replaced, otherwise the long term yield potential of the paddock will be down.

### *Post-Sow Insects*

The greatest problem in the last few years has been with Red Legged Earthmite. It is essential to monitor the paddocks with emerging wheat seedlings and to spray if RLEM are present.

### *Weed Control*

Two options exist, pre and post sow control. Your best source of information on weed control is your local chemical re-seller. Also refer to the articles in this publication prepared by Rob Velthuis from Du Pont.

One major warning is against Herbicide Resistance developing in ryegrass and wild oats. You cannot continue to use the selective grass herbicides (such as Hinegrass,

Grasp, Tristar, Puma, Fusilade, Sertin, Verdict, Targa etc) year after year with impunity. The BCDS strongly urges you to become more familiar with herbicide resistance. It is a problem with which all farmers who use chemicals will come in contact. Further reading on Herbicide Resistance:

- \* AVCA Guidelines
- \* A practical guide to the successful management of Annual Ryegrass Resistance (Hoechst)
- \* Herbicide Resistance Awareness Strategy (Nufarm)
- \* Weed Smart - a GRDC sponsored program

### *Disease Management*

The major root diseases Cereal Cyst Nematode (CCN or eelworm), Take-all and Rhizoctonia are covered by articles prepared by David Roget and Frank Henry.

### *Insurance*

Always a wise precaution against the devastation of hail etc.

### *References*

Martin, P. and Dykstra, D. (1993). Wheat Variety Information. Dept. of Agriculture, Victorian Institute for Dryland Agriculture, Horsham.

## **CHICKPEAS**

Two types of Chickpeas are commonly grown in Australia - the Kabuli and Desi types.

*Kabuli type* - the Kabuli chickpea is larger than the Desi type (6 - 10 mm vs < 5mm), is cream to white in colour, and is eaten whole. The Kabuli is best grown on clay and clay-loam soil types, matures later than the Desi type and needs to be grown in an annual rainfall zone of more than 450 mm. Kabulis are very sensitive to damping off, grey mould (Botrytis), frost and insect attack. The most commonly-grown variety is Kaniva.

*Desi type* - the Desi chickpea is small (same size as a pea), brown in colour and the seed is more angular. Desi types are usually split and eaten as 'dahl'. Both Chickpea fetch prices at the premium end of the market because they are used for human consumption, the highest prices going to large, creamy coloured Kabulis. Desi chickpeas are best grown on clay to clay-loam soils. They do not perform well on sands, but they can be grown in drier areas compared with the Kabulis. Desis are

best suited to the 350 to 450 mm annual rainfall zones. The Desi varieties are: Tyson, Dooen, Amethyst and Desavic.

**Tyson:** is an early to medium maturity variety (sown in May, it will flower towards the end of September to early October). Tyson performs well in the less than 400 mm rainfall zone. Tyson is very short which can be a problem at harvest.

**Dooen:** is an early to medium maturity variety, does not have the drought tolerance of Tyson and is best suited to the 400+mm annual rainfall zone. It has a more vigorous seedling and is slightly taller, making it easier to harvest. It is prone to lodging. Dooen does not tolerate high rates of trifluralin. The seed is larger than that of Tyson.

**Amethyst:** is similar maturing variety to Tyson, it is also taller but does not have the early vigour that Dooen has. It tolerates waterlogging better than Tyson but is very susceptible to phytophthora. Amethyst is best suited to the 400 to 450 mm annual rainfall zone.

**Desavic:** is a new release and the preferred variety. It has good drought tolerance, similar to Tyson, and is best suited to the 350 to 450 mm annual rainfall zone. It will not tolerate waterlogging. It has a larger seed size and is a taller variety than to Tyson. It also has good seedling vigour.

#### *Paddock Selection*

Chickpeas grow best on neutral to alkaline, well structured soils with a good water holding capacity (ie. clays and clay-loams). They do not tolerate waterlogging and paddocks prone to water should not be used. Chickpeas generally flower in early October and will tolerate warm temperatures at flowering, as long as reasonable soil water reserves exist at that time.

#### *Sowing Time*

Chickpeas are best sown in May to early June

#### *Sowing Rate*

Because of the large variation in seed size and weight, it is not possible to give an overall sowing rate recommendation. The viability of the seed can also have a major impact on the sowing rate required (note: remember the very poor quality seed following the 1992 harvest!).

The aim is to grow around 35 to 40 plants to the square metre for the Kabulis and 40 to 45 plants to the square meter for the Desi types. This is usually achieved by using a sowing rate of 80 kg/ha, but with chickpeas it is important to determine this accurately.

The required sowing rate can be calculated by:

1. weigh, in grams, 100 seeds
2. determine the germination rate (put some soil from the paddock in which the chickpeas are to be grown into a shallow tray, evenly spread the seed and cover with 1cm of soil. Water the tray regularly and after ten to fourteen days count the number of seedlings. The number emerged will give you the germination rate as a percentage).
3. determine the target density (ie. 45 for the Dcsi type)
4. use the following equation to set the seeding rate

$$\text{Rate (kg/ha)} = \text{weight (grams)} \times \text{required density} \times 10/\text{germination percentage}$$

#### *Sowing Depth*

Similar to peas, around 3 to 4 cm deep is best. Avoid sowing too deeply, otherwise this will slow the germination down even more.

#### *Inoculation*

For good nodulation, chickpeas should be inoculated with Group N inoculant. This is especially important on 'new' ground.

#### *Weed Control*

Compared with most other crops, chickpeas is a slow early grower providing little competition for weeds. The best indicator for choice of paddock, after soil type is minimal weed burden. A spring cleaned paddock in which the weed seed bank is low is best. Metribuzin and Simazine applied post sowing pre-emergence will effectively control a wide range of broadleaf weeds. The grass-selective herbicides, such as Fusilade, Targa, Verdict etc. are safe to use on chickpeas.

#### *Disease Management*

Chickpeas are prone to several root rots and other fungal diseases. Most of these diseases are more prevalent in wet years. Using disease free seed is the best control method for a wide range of chickpea diseases. Using the fungicide P-Pickie T as a seed treatment will also assist in reducing the incidence of some of the fungus diseases. Thiram may also be an option for reducing the incidence of Grey Mould (Botrytis) in Kabuli chickpeas.

Inoculation and seed fungicide treatment - the fungicide is antagonistic to the bacteria in the inoculant. The best strategy is to treat the seed first with the fungicide (up to two weeks prior to sowing) and then, several hours before sowing, inoculate

the seed. But remember to make sure the seed is dry before sowing, otherwise the seed won't flow evenly.

### *Insects*

Red Legged Earthmite after emergence can be a problem - monitor and treat accordingly.

Heliothis at the podding stage is the major insect pest on chickpeas. Sweep nets, or using the bag between rows technique and shaking the plants are the best way to monitor grub numbers. Spraying the grubs while they are still small will reduce the rate of insecticide you need to use. But you should budget for at least one spray.

Check with your local delivery point on the acceptance level of damaged seed.

### *Nutrition*

Similarly to other grain legumes, chickpeas have a high requirement for Sulphur. If the paddock has been sown with high analysis fertilisers for the last five years and has not had gypsum, then a fertiliser containing sulphur (as sulphate) is essential. It should not be necessary to sow chickpeas with a nitrogen based fertiliser, although some farmers have reported good success using a low rate of N at sowing (such as is supplied through MAP). Apparently this encourages early growth and makes the crop withstand the cold winter period better. Of course this is an option only after the sulphur component has been addressed.

### *Harvest*

The Chickpea plant is short and is generally slow to harvest. Avoid letting the crop become over ripe because there will be too much shedding of pods.

Use a drum speed of about 50% of that used for cereals otherwise there will be too much grain damage.

## PEAS

**The main Pea types are the:**

Dun types - used mainly for stock feed (Early Dun, Dundale, Maitland, Alma and Glenroy)

White Pea types - mainly used for human consumption (Wirrega, Dinkum and Bonzer)

Blue Boiler type - grown for the canning industry, usually under contract (Bluey)

### *Varieties*

Dun and Dundale - the most widely grown Pea varieties. Dundale is a slightly earlier maturing variety compared to Dun, and it flowers around 10 days before Dun. Dundale is best suited to the low rainfall areas (< 400 mm), whilst Dun is best suited to the 400 to 450 mm rainfall zone.

Maitland - a semi-leafless variety. It is a tall and later maturing variety. Seed is slightly larger than Dun.

Glenroy - resistant to powdery mildew, but requires a longer growing season compared with Dun, thus its use in the lower rainfall areas is doubtful. Best suited to the 400 mm plus rainfall zone.

Wiirega - white flowered and the seed is smooth and rounded. Best suited to rainfall areas with more than 475 mm of annual rainfall.

Bluey - is a short, semi-leafless pea with large cream coloured seed. It should be well suited to the 400 mm plus rainfall zone.

### *Paddock Selection*

Peas are best grown on clay to clay-loam soils, and fair produce yields on sandy soils. The most suited soil pH range is between 6.0 and 9.0. Peas have only moderate tolerance to waterlogging, with the result that paddocks very susceptible to waterlogging should be avoided.

### *Sowing Time*

The optimum sowing times depend on the rainfall zone. In areas with less than 375mm of annual rainfall, the best sowing time is early May, in the intermediate districts with up to 450 mm of annual rainfall around mid May to early June, and in the higher rainfall districts with more than 500 mm, early to mid June.

### *Sowing Rate*

Optimum sowing rates depend on the rainfall zone. In the low rainfall zone about 25 plants per square metre should be the target, in the intermediate areas - 30 to 35 plants/m<sup>2</sup>, while in the high rainfall zone around 35 to 50 plants/m<sup>2</sup> is best.

The explanation provided in the chickpea section as to how to determine optimum sowing rate should be followed. The range of sowing rates to achieve the above densities will be about 100 to 110 kg/ha of seed, but this will depend greatly on seed size and weight, and on seed viability.

### *Sowing Depth*

Three to four centimeters deep is the best sowing depth for peas.



### *Inoculation*

Peas should be inoculated with group E inoculant. Inoculation should not be necessary in country that has been previously sown to peas. However, it will be a good idea to check nodulation during the season to make sure the bacteria are there (see paper by Greg Bender - 'Legume Inoculants & Nodulation').

### *Weed Control*

Trifluralin is commonly used to control the early germinating grasses, as well as wireweed and fumitory.

Weed control post emergence is also commonly practiced with MCPA (sodium salt), Brodal, Metribuzin and Tribunil. Note: there are no weed control options for silvergrass.

### *Diseases*

Peas are susceptible to a wide range of diseases and these are the most likely cause of disappointing yields. The most common diseases are:

Powdery Mildew - Because this is a mainly air-borne disease, rotations are unlikely to control it. Fungicidal sprays may provide some control but it is important to apply the spray on the very first sign of the disease. The new variety Glenroy is resistant to Powdery Mildew.

Black Spot - The incidence of Black Spot varies between seasons. The disease is most common in wet years. The disease is carried on old pea stubble and is then spread by wind. Sowing infected seed can also cause infection. P Pickle T provides useful protection early in the season.

Root Rots - affects, as the name suggests, the roots of plants, so that the roots are stunted and are unable to provide sufficient water to the plant during warm weather with the result that the plant dies. Waterlogging increases the incidence of the disease and as do rotations in which peas are continuously grown. P Pickle T provides useful protection early in the season.

Bacterial Blight - is a very common disease in peas, most common in wet years. Stresses such as hail damage and frost also encourage the disease. It is essential to use Bacterial Blight free seed as a control option. The South Australian Department of Primary Industries provides a testing service for Bacterial Blight (phone 08 3722349). Spraying fungicides such Kocide provides useful protection if used early in the disease outbreak.

Damping Off - is a disease caused by Pythium. Quite common in wet conditions, P Pickle T and Apron provide useful protection for seedlings.

Downy Mildew - is very common in peas, and is spread and carried by trash and infected seed. Reducing pea trash and using clean seed are the best control options. Apron provides control early in the season. Foliar sprays, such as Bravo, can be used later in the season.

The best control options for most diseases in peas are:

- avoid paddocks prone to waterlogging
- use clean seed
- burn/cultivate trash
- remove self sown peas out of cereal crops
- if possible, extend the rotation sequence in which peas are used

### *Insects*

Early insects such as lucerne flea and Red Legged Earthmite should be monitored closely and treated accordingly.

Pea Weevil - The beetles emerge in warmer weather (17-20° centigrade). Eggs are laid on the pods which haven't filled as yet, and the larvae bore their way into the pod, where they are protected from insecticide sprays. The larvae feed and pupate inside the seed. The adult pea weevils emerge in December and hibernate over summer in old trees, fence posts etc. The resultant infestation occurs mainly close to the fence lines (95% of eggs are laid within 50 metres of the fence).

It is essential to monitor, by using a sweep net, the occurrence of Pea Weevils. Start monitoring when the weather gets warmer and begin close to the fence lines or old trees in the paddock. Border sprays are usually successful but their effectiveness depends on how well you have picked up the weevils in your monitoring. If you don't monitor widely enough and therefore do not spray widely enough, control is only poor. Insecticides only provide short term protection; continuous monitoring is essential.

A good strategy to make sure you don't sow weevil infested seed is to use for seed, grain harvested only in the middle of the paddock.

Heliothis (Native Budworm) - The adult moths are active at night and become quite common at the late flowering stage. The larvae bore into the pods and can cause large amounts of damage. Sweep netting, or the bag between rows and shaking plants technique, are both useful for monitoring grub numbers. Spraying should begin when grubs are smaller than 10 mm, otherwise the cost of insecticides becomes too high.

### *Nutrition*

Similarly to other grain legumes, chickpeas have a high requirement for Sulphur. If the paddock has been sown with high analysis fertilisers for the last five years and has not had gypsum, then a fertiliser containing sulphur (as sulphate) is essential.

### *Harvest*

A dirty slow job! Stones and clods are a problem. Open fronted harvesters require crop lifters to assist with picking the whole plant up.

## CANOLA

The area sown to Canola in the southern Mallee and northern Wimmera is expected to increase dramatically this coming season. The expected high prices for Canola and the very good yields achieved over the last two seasons are encouraging many growers to try canola for the first time. We must remember that prices are never stable, regardless of assurances given, nor should we regard the finishes in 1992 and 1993 as normal! Nevertheless, it is still true that canola can be a very profitable crop - but you need to plan for it! Nutrition, protection from insects and weed control are essential if a good crop is to be harvested. And do not forget that canola needs to be windrowed and you may not have the appropriate harvester - allow for these two contract jobs in your deliberation as to whether canola is for you.

### *Varieties*

New canola varieties have been coming onto the market over the last two or three years. The new varieties for 1994 are Dunkeld and Rainbow. For both of these, seed will be hard to get close to seeding because of the high demand.

Oscar - the best all round performer. Oscar has reasonable Black Leg tolerance and is a good variety for districts with an annual rainfall greater than 425 mm.

Rainbow - best suited in drier areas (below 425 mm but can also be grown in wetter districts). It flowers 3 to 5 days earlier than Oscar and has good seedling vigour. Oil content is slightly higher than Oscar.

Dunkeld - better suited to the 425 mm or more rainfall districts. It flowers a few days later than Oscar, but has 3% more oil, good seedling vigour and good tolerance to Black Leg.

Narendra - is a West Australian variety. It is a short season variety, flowering about 10 days earlier than Oscar. It may be better suited to the drier areas in the southern Mallee, but it really is an untried variety in the area. Compared with Oscar, it may also be better suited to the lighter soil types. Its disadvantages are its lower oil content and less tolerance to Black Leg.

Hyola 42 - is a hybrid and a shorter season variety compared with Oscar (5 to 14 days earlier). Hyola 42 is untried in the drier districts of the southern Mallee. It has good seedling vigour and has an oil content higher than Oscar. Hyola 42 only has low level of resistance to Black Leg, and in years when this disease is a problem the more resistant varieties will do better.

### *Paddock Selection*

Canola does not tolerate water logging very well, especially at flowering, so do not sow canola in susceptible paddocks. Soil pH should not be a problem in our district. Canola seed is only small and the seedling will have problems growing through a crusted soil surface. Weed control options in canola are very limited, so make sure that the weed burden is low. There are no herbicides on the market in Australia which control Brassica weeds, so avoid paddocks with Radish, Mustard etc.

### *Sowing Time*

If the season allows, sow from late April onwards. In some areas in 1993, canola crops which were sown early only received patchy follow up rain which resulted in a poor, staggered germination (in many cases mice were wrongly accused of causing this).

### *Sowing Rate*

The optimum number of plants for canola is 70 to 100 per square metre. This can be achieved by sowing 4 to 6 kg of seed per hectare. The lower rate can be used if the soil is warm (ie. early sowing) and the soil has an excellent seedbed. Use the higher sowing rate when sowing later in the season.

### *Sowing Depth*

Because Canola seed is small, it is important to sow it carefully. On average only some 60% of the seeds actually establish. The optimum sowing depth is between 1 to 2 cm deep. Levelling bars, mesh harrows or rollers can all assist in providing an even cover and also provide seed soil contact. It is best to sow the seed rather than to drop it on top and harrow it in.

### *Weed Control*

Weed control options with canola are very limited, thus it is essential to control weeds the season before the canola is to be sown. Weeds such as Capeweed also are carriers of Sclerotinia so it is essential that the burden of these weeds in the paddock be minimal. Trifluralin can be used with good safety on canola, although in late sowings the rates of Trifluralin should be reduced. Lontrel is registered in canola and is excellent for the control of Capeweed and thistles. Grass weeds can be controlled with a wide range of grass selective herbicides, but remember none of these control silver grass! It is essential to have good grass control because you are

growing canola for two purposes: 1. as a crop with a potential good gross margin, and 2. as a disease break before a cereal.

### *Diseases*

Because most of the diseases prevalent in canola are carried over from previous crops, it is best to leave at least three years between crops in the same paddock.

Black Leg used to be the most common disease in canola, but with the newer more resistant varieties this disease is now much less of a problem.

Sclerotinia is carried by weeds such as capeweed and in crops such as peas and lupins. It is essential to control broadleaf weeds, which carry the disease, in the year prior to sowing canola.

Work with fungicide fertilisers has shown some very promising results. This indicates that early disease control is essential and that many diseases are still affecting our canola crops.

### *Insects*

Red Legged Earthmite are dynamite on canola! It is strongly advisable to treat the seed with a suitable insecticide prior to sowing, or at least monitor the crop regularly (every two days) as it is emerging and spray on the first signs of earthmites. If you can't see any earthmite it does not mean they are not there! It could be your eyesight. If the crop has small grey mottles on the leaves it is time to get out the boom spray.

### *Nutrition*

Canola has a very high requirement for Phosphorus, Nitrogen and Sulphur. Using the same fertiliser strategies as these you use for cereals will not ensure a high yielding canola crop!

Phosphorus - use at least 15 kg of P per ha (as can be achieved with sowing 75 kg/ha of MAP)

Nitrogen - canola requires much higher rates of Nitrogen fertiliser compared with those farmers generally use. Canola does not suffer from haying off and much of the excess, if any, nitrogen applied will be available for the subsequent cereal crop. The amount of N which needs to be applied will depend on the paddock history. An excellent clover or medic history will reduce the N which needs to be applied. If canola is sown in a paddock which has been cropped for a number of years then at least 50 kg of N per ha will be required.

The best timing for Nitrogen fertiliser on canola appears to be as a pre-drilling operation.

**Sulphur** - Canola needs more sulphur than most other crops. There are many reported cases in which canola was sown in paddocks which have only had high analysis fertilisers for the last decade and sulphur was limiting production. Deficiency of sulphur in canola is most evident close to flowering and pod fill. Many fertilisers, especially the high analysis types, are low in sulphur and will not be able to fill the high sulphur demand. Some forms of fertiliser which state they have a sulphur component contain elemental sulphur. Elemental sulphur takes a long time to break down to sulphate (the plant available form) especially on alkaline soils. Canola crops require between 10 and 20 kg/ha of sulphur.

**Table 3. Three fertiliser strategies to sow with 15 kg/ha of Phosphorus, about 15 kg/ha of Sulphur and about 40 kg/ha of Nitrogen**

Fertiliser strategy	Rate (kg/ha)	N (kg/ha)	P (kg/ha)	S (kg/ha)	cost \$/ha
Single super Urea	170	0	15	19	27
	90	42	0	0	28 55
MAP Stimulus	68	7	15	1	24
	120	36	0	17	35 59
MAP Urea Gypsum	68	7	15	1	24
	90	42	0	0	28
	300	0	0	45	8 60

Note: strategy 3 would supply sufficient S for several years. This is the minimum rate at which gypsum can be spread.

### *Windrowing*

Canola is a difficult crop from direct head and shattering of pods can be a real danger. Windrowing is almost essential. Cost of windrowing is around \$20 to \$30/ha and the timing of windrowing is absolutely critical. Organise a contractor if you can't do it yourself well in advance. Canola is ready for windrowing when about one-third of the seed has turned dark in the pod.

### *Harvest*

Harvest contract prices can be high and depend on the quality of the windrows. You can pick up the windrows with most open fronted headers, but watch the settings. Remember the grain is quite small and you can lose a lot even through small gaps.

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