NSW DEPARTMENT OF
PRIMARY INDUSTRIES

CANOLA: NORTHERN NSW PLANTING GUIDE

Better Varieties Faster

Key Management Issues

- Use no-tillage as it stores more soil moisture than conventional fallows.
- Ensure heavy stubble does not cover the plant line as it will impede canola establishment.
- Always sow on at least 80 cm depth of wet soil in eastern areas and 100 cm of wet soil in the drier western areas.
- Phosphate nutrition for canola is very important. Canola can respond to phosphorus on soils where wheat does not.
- Use similar rates of nitrogen on canola as you would for high protein wheat in the same soil.
- Grow varieties suitable for your conditions. Early maturing varieties are generally more suited to western areas, and mid season types to more favoured eastern growing areas. Grow several varieties to spread harvest timing and the risk of unfavourable events e.g. moisture stress and frost. Consider herbicide tolerant varieties e.g. triazine tolerant (TT) or Clearfield* where weeds are a problem.
- Sow mid season varieties from early May and early varieties from mid May to minimise frost risk.
- Aim to establish 30–50 plants per square metre, which can be achieved by sowing 2–4 kg of seed/ha.
- Monitor crops for insect pests during the critical times of establishment, flowering and podding. Take account of beneficial insect numbers when making decisions on control options.
- In rotation, canola is best followed with a winter cereal, as disease levels (e.g. crown rot) should be reduced and VAM* (*Vesicular Arbuscular Mycorrhiza*) is not a high requirement with these crops.
- Aphids – The last two seasons have seen high levels of aphids in spring, monitor aphid levels in autumn and spring to reduce the impact of virus transmission and crop stress from feeding.

* VAM is a beneficial soil fungus which enhances soil uptake of phosphate and zinc for most crops.

Introduction

Canola can have an important role in northern NSW cropping systems, particularly in the higher rainfall areas of the region. It generally yields 40 to 60% of wheat grown under similar conditions and in normal years, average yields of around 1.5 t/ha should be possible with good management. In the very dry year of 2002, canola yielded about 40% of wheat.

Canola has yielded over 3 t/ha in northern NSW under favourable soil and climatic conditions and can be expected to reduce root and crown rot diseases in the following wheat or barley crop.

Seasons which experience above average rainfall in winter and early spring tend to favour canola growth and under these conditions the crop can yield up to 60% of wheat. Oil contents of canola under such conditions are also higher. Canola does not tolerate drier seasons as well as wheat or barley.

Always sow on at least 80 cm depth of wet soil (approximately 150 mm of soil water) in eastern areas and 100 cm of wet soil (approximately 180 mm of soil water) in the drier western areas.

Computer modelling using the program APSIM has shown the importance of sowing canola into a good profile of stored water. At Walgett the model predicts canola production will be marginal if less than 55 cm of wet soil (100 mm of soil water) is available at sowing and in 50% of seasons, yields will be equal to or less than 1.2 t/ha. Whilst the model predicts that sowing at Gunnedah with 55 cm of wet soil (100 mm of soil water) would result in much higher yields in 50% of seasons of around 2 t/ha.

While many growers had poor experiences with growing canola in the early 1990's, due to frost damage, improved varieties better adapted to northern conditions are now available. This coupled with improved agronomic information has renewed grower confidence in canola.

However, in 2004 frosts in mid September and early October caused significant yield losses and reduced oil contents.

Rotation effects

Canola can reduce the incidence of some cereal root and crown diseases, such as crown rot and

take-all. Research has shown canola to be the most effective winter crop for reducing crown rot levels in subsequent wheat crops.

Canola can have both positive and negative effects on subsequent crops. Canola is non-mycorrizal, and so VAM levels can fall under canola. This may disadvantage crops sown after canola, which are highly dependent on VAM. Crops affected include all commonly grown summer crops (sorghum, cotton, maize, sunflower and the summer pulses) as well as faba bean and chickpea.

Wheat, barley and oats have a low dependence on VAM, and so can be readily grown in rotation with canola. As canola reduces VAM levels the same way as long fallows do, canola should be grown with short (about 6 months) fallows before and after it.

Research has shown that wheat yield increases in the order of 0.6–1.0 t/ha can be expected when following canola compared to wheat following wheat.

Zero tillage, which retains more stubble, is increasing the carryover of many of the main cereal diseases, such as crown rot, in northern NSW. Canola fits well into this system by allowing an additional season for cereal stubble breakdown to occur and therefore reducing the carryover of disease.

Maintaining a rotation of one canola crop every four years also minimises the potential for disease build-up in the canola.

The use of triazine tolerant varieties has helped to control difficult weeds such as bindweed and fleabane.

Rutherglen bugs may be present in large numbers on canola stubble around harvest time. These can readily move into neighbouring summer crops or crops planted directly into the canola stubble causing serious damage.

Sowing

Early sowings maximise yield potential and oil content but sowing too early increases the risk of frost damage during the late flowering and pod-filling stages. Sow mid season varieties from early May and early maturing varieties from mid May. Delay sowing further in paddocks known to have high frost risk. Seek guidance from experienced agronomists in your district, but in general finish sowings by about June 1 around Moree and June 15 south of Gunnedah. Within these guidelines, consider sowing several varieties with different maturities and even several sowing times to spread the risks of unforeseen seasonal factors such as moisture stress or frost. Canola usually flowers for 3–5 weeks, and frost damage is greatest if it occurs towards the end of flowering and through pod filling. Early maturing varieties sown at the beginning of May would be subject to frosts in the late flowering and pod-filling stages, whereas mid season varieties will flower and fill pods later, reducing the risk of frost damage.

The small seeds of canola need to be sown ideally no more than 5 cm deep in self-mulching clays (2–3 cm in red soils) into well prepared, moist seedbeds. Good seed-soil contact, to help ensure uniform establishment, is aided by the use of rollers, culti packers and press wheels. The crop is suited to conventional and no-till systems. Heavy stubble loads may reduce emergence, and should not be left over the sowing row. Triazine tolerant varieties are less vigorous so planting methods are more critical for even establishment.

Aim to establish 30 to 50 plants per m^2 in northern NSW, which can be achieved with 2–4 kg/ha of seed (provided it is good quality seed).

Variety Selection

The main features to consider when selecting a variety are: maturity, yield, oil content, herbicide tolerance and blackleg resistance. Early maturing varieties are generally more suited to drier western areas, and mid season types to favoured growing areas. Refer to the latest *Canola: NSW planting guide* for a description of variety characteristics and performance in northern NSW and statewide.

Nutrition

Nitrogen

Canola has a high nitrogen (N) demand. For example, a 1.5 t/ha crop at 22% protein in the seed removes about 53 kg/ha N. To grow the plant, the crop should have available to it a total of about 140 kg/ha of N from all sources. Depending on the amount of soil N available to the crop, about 80 to 100 kg/ha of fertiliser N would be needed. In general terms, a canola crop requires a similar amount of N as a high protein wheat crop.

Deep soil testing for nitrogen and sulfur (see below) is recommended for all growers, but particularly first time growers. This will allow N budgeting.

Canola seed is very sensitive to fertiliser burn. No more than 10 kg/ha of nitrogen should be in direct contact with the seed at sowing in narrow (18 cm) rows and proportionally less in wider row spacings. The majority of the nitrogen should be either drilled in before sowing or mid-row banded at sowing. An alternative is to apply nitrogen to the growing crop. Application timing should aim to minimise losses from volatilization i.e. time the topdressing when the crop has good ground cover and before a rain event. Losses can be high on dry alkaline soils.

Phosphorus

Research in northern NSW has shown that phosphorus (P) application is more critical for canola than for

wheat grown under the same conditions. Results have consistently shown greater responses to P in canola than wheat, and responses have occurred on soils with up to 25 ppm available bicarbonate-P and in situations where wheat has not responded. Hence it is critical that P be applied to canola unless soil tests indicate that the soil is well supplied with this nutrient.

Sulfate sulfur

Canola requires about 10 kg of sulfate sulfur per tonne of grain. The standard recommendation in southern NSW is to apply 25 to 30 kg/ha of sulfate sulfur. In northern NSW, commercial sulfur trials in 1992 and 1993 demonstrated a lower requirement on soil types which have naturally occurring gypsum at depth, typically the grey and black clay soils. This was identified in a deep (60 to 90 cm) soil test. Under these conditions, 10 kg/ha sulfate sulfur was generally adequate to supply crop requirements until the crop roots accessed deep soil sulfur. Sulfate sulfur is best applied before or at planting. Sulfur deficient canola responds well to topdressing and economic responses have been recorded up to the flowering stage in salvage situations.

Zinc

Although canola is a non-mycorrhizal crop, it requires zinc on alkaline soils. The actual level of response in northern NSW is not known, but in the absence of better information, use wheat guidelines.

Zinc is best applied to the soil and thoroughly incorporated, but if this is not possible, apply it with starter fertiliser and place it 2.5 cm beside and below the seed at planting.

Foliar sprays of zinc sulfate heptahydrate at 1 kg/ha plus wetting agent are an alternative application method if sprayed twice to deficient crops at 3 and 5 weeks after emergence. Zinc sulfate is incompatible with most herbicides and insecticides. Zinc seed treatments are not normally applied to canola as insufficient zinc will be applied with the low seeding rate used.

Insects

Insects which could pose a problem in northern NSW include blue oat mites, red legged earth mites, cutworms, diamondback moth, heliothis, aphids and Rutherglen bugs. Refer to the publication *Insect and Mite Control in Field Crops* for information on thresholds, crop growth stage, crop damage, registered pesticides and some biological control aspects.

Gaucho® (imidacloprid) is a seed dressing which protects emerging seedlings from red legged earth mite, blue oat mite and aphids for approximately 3–4 weeks after sowing. Cosmos® (fipronil) is a seed dressing which protects seedlings from red legged earth mites.

Virus can also occur in canola. This is carried by aphids that suck sap from leaves, transferring the virus and causing yield loss and sometimes plant death.

Protection against early aphid infestation in seedling canola may reduce the incidence of virus in the crop. Gaucho® (imidacloprid) is the only seed dressing registered for control of aphids in canola. Sowing canola into standing cereal stubble may help to reduce aphid numbers and hence virus infection. Aphid control during the crop's growth can be achieved through the use of several registered products.

Root lesion nematodes can also have an impact on canola growth. However, following harvest, the levels of nematodes (*Pratylenchus neglectus*) have been found to decline rapidly due to the release of isothiocyanates from the decomposing root tissue. Sulfur deficient or stressed crops are more likely to host increasing nematode numbers during the season and have less effect on their decline at the end of the season.

Canola is susceptible to attack from *Pratylenchus neglectus* but moderately resistant to *Pratylenchus thornei*.

Diseases

Two major diseases of canola, which should be considered, are blackleg and sclerotinia. Although blackleg is less prevalent in the north, it is critical that blackleg be controlled by growing resistant varieties and having a three year break between crops to allow all the stubble to be broken down. Chemical treatment is available if considered necessary.

Several seed dressings provide suppression of the blackleg fungus e.g. Jockey®, QuantumTM, ProwessTM (fluquiconazole) only and the product Maxim® (fludioxonil/metalaxyl –M) provides suppression of blackleg as well as control of *Pythium* spp. and *Rhizoctonia solani*.

Impact®, Bayonet® and Jubilee® (flutriafol) are in furrow treatments registered for the control of blackleg.

Sclerotinia stem rot is favoured by wet springs that produce cool, humid conditions in dense crops. Most broadleaf crops and many broadleaf weeds are hosts of sclerotinia. Symptoms include fluffy external growth on the stems, in which numerous black bodies (sclerotia) are found. Refer to the *Canola* Agfact P5.2.1 for further information and photographs. One possible control measure is a rotation of at least 4 years with no susceptible hosts.

Weed Control

Choose paddocks relatively free of broadleaf weeds especially charlock, wild turnip, wild radish and other weeds of the Brassica family, as in-crop herbicide options are very limited. If canola is to be grown

where these broadleaf weeds occur, use a triazine tolerant variety and spray either atrazine or simazine pre-emergent or atrazine post emergent. Grass weeds can be readily controlled in canola using trifluralin or post-emergent herbicides.

When choosing paddocks for canola, be careful with those treated with residual herbicides especially Group B and triazine herbicides (for conventional varieties) as their residues can affect canola. Check labels for re-cropping intervals as some are up to 36 months.

Ensure all spray equipment is thoroughly decontaminated before using it to spray canola. Use chlorine if the spraying equipment has previously been used to spray sulfonylureas, ammonia for hormone herbicides (salt and amine formulations) such as 2,4-D amine and MCPA and liquid alkali detergent for Broadstrike® and Eclipse® decontamination. Where possible, use separate spraying equipment for residual herbicides such as the sulfonylureas.

Imidazolinone tolerant varieties are marketed as Clearfield* canola. These varieties allow the use of the Group B herbicide On Duty® (Imazapic and Imazapry). Clearfield* varieties do not suffer from the yield and oil penalty which the triazine varieties exhibit. The use of Clearfield* varieties allows the rotation of herbicide groups and broadens the spectrum of weeds controlled.

Harvesting

Canola generally withstands extended wet harvest periods better than other crops such as wheat. However, severe windstorms can cause seed shatter more readily in canola, but newer varieties have been selected to improve this characteristic.

Crops can be either windrowed or direct harvested. The method chosen depends on the availability and cost of contract windrowing, the type of harvesters available and the relative risk of adverse weather in a particular locality. Some of the advantages of windrowing are: uniform ripening, earlier harvesting (7–10 days), less exposure to spring storms and rain, reduced shattering losses during harvest and less hail and wind losses. Harvesting can usually continue 'around the clock'.

Windrowing should start when 40–60% of seeds have changed colour to red, brown or black. As the crop is usually ready for windrowing 20–30 days after the end of flowering, regularly check the crop for seed colour changes. The end of flowering occurs when only about 10% of plants have any flowers left on them.

Windrowed crops should be ready to harvest 5 to 14 days after windrowing depending on the weather. The moisture content of the grain should be 8% or less.

Direct harvesting is cheaper than windrowing and can be done with either an open-front with an extended platform or with a belt-front attachment. Canola is ready to harvest when nearly all the pods are dry and rattle when shaken, pods are pale brown and the seeds are dark brown to black and have less than 8% moisture content.

Further information

Contact your local office of NSW Department of Primary Industries for Agfacts or other publications. See your district agronomist for additional information or advice.

See also the NSW Department of Primary Industries website www.agric.nsw.gov.au

NSW DPI publications:

McCaffery, D. Parker, P. Wratten, N. and Mailer, R., *Canola: NSW planting guide 2005*.

Colton, R.T., and Sykes, J.D., *Canola*, fourth edition, 1992, Agfact P.5.2.1.

McRae, F. J., McCaffery, D. W., and Matthews. P.W., *Winter Crop Variety Sowing Guide 2005*.

Francis R. J., Brooke, G and McRae, F. J. *Weed Control in Winter Crops 2005*.

Hertel, K. and Roberts, K., *Insect and Mite Control in Field Crops 2005*.

The latter publication should be available in June 2005.

Disclaimer

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