

FITT Final Report (09FT217)

(Rape scald in Otago-Southland)

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Group that proposed the project: Otago-Southland rape scald group
Region: Otago/ Southland

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(1) Introduction – background to the project

Rape (*Brassica napus* L.) offers significant potential for providing Otago-Southland farmers with a better quality of feed over the lamb finishing period. With the advent of heavy weight lamb contracts and a more variable climate due to climate change, the use of rape in summer/autumn is likely to increase. However, some farmers are being put off sowing rape owing to the potential for their stock to get rape scald, or they have experienced the problem first hand in the past. The specific compound in rape which causes rape scald is as yet unknown. However, some management practices have been established that tend to reduce the incidence of rape scald with varying degrees of success around the region. This project aims to put an estimate on how bad rape scald is in Otago and Southland. Also, to possibly correlate management practices with the incidence and severity of rape scald so that farmers can be more informed on the issue and more able to capture the benefits of rape.

(2) Key aims – what was the project trying to achieve?

- *An estimation of the area of rape grown in Otago-Southland**
- *An estimation of the incidence and severity of rape scald in Otago-Southland**
- *Identification of management practices that may be responsible for or mitigate rape scald**

(2) Key findings & recommendations for farmers

- Average yields of 6250kg DM/ha were calculated from the farmers who knew their rape yield. However, only 38% of respondents could estimate yields on a kg DM basis**
- Of the farmers who had sown rape before, 57% indicated that they experienced some level of rape scald in their lambs**
- Of the farms that reported rape scald:**

- **87.2% of lambs showed no visual symptoms**
- **9.2% showed mild symptoms**
- **3.5% showed moderate symptoms**
- **0.1% died due to secondary infections**
- **The farmer group who replied to the survey were likely to be skewed toward having experienced rape scald compared to the general population. However, lambs displaying visual symptoms of disease are generally the tip of the iceberg**
- **Best management practices for grazing rape were generally being applied by farmers**
 - **However, in the first 2 days of grazing on average, farmers thought they were feeding 44% of lambs diets as rape compared to the recommended 20%**
 - **Only 19% of farmers said they grazed rape at the appropriate level of maturity (when leaf edges turned to a purple or red tinge)**
 - **A novel method of tasting the rape (for sweetness) to test for maturity was mentioned by a couple of farmers**

(4) Methodology – what was done in the research?

A preliminary survey was conducted and distributed through a Rural Delivery drop of districts in Otago and Southland. The purpose of this survey was to gain basic information about their farms so that the right range of farmers were selected to answer the more detailed telephone interview. The preliminary survey consisted of a double sided A4 sheet. On one side was an introductory letter explaining rape scald and the basis of the project. The survey was kept to 1 side of an A4 page to make it easier for farmers to mail or fax it back to AbacusBio Ltd. Keeping it short would also help maximise responses. Apart from farm details, the preliminary survey questioned whether rape scald occurred on the farm and to what extent. Farmers had the choice to indicate whether they wanted to participate further in the project. This gave a sample of farmers willing to answer a more in-depth interview over the telephone.

The telephone interview went into more detail of the management surrounding the farmer's rape crop when grazed with lambs. This included details of the rape crop such as cultivar, their estimated yield, days post sowing it was grazed and fertiliser management. Rape leaf colour at grazing time was also questioned with a choice of colours such as green, green/blue, purple/red with tinges on the edges or if they did not know the colour. This question would not only answer what colour farmers grazed their rape at, but would answer whether farmers actually use colour as a method to time their first rape grazing. If for example farmers indicate they do not know the colour it was grazed it could indicate that they do not use colour as a way of telling when their rape is mature.

(5) Results

Survey response:

One thousand four hundred and forty initial Rural Delivery drop surveys were sent around 11 different areas around Otago and Southland. Twenty nine surveys were either faxed or posted back (2% of total) with 17 agreeing to partake in further phone interviews. Sixteen surveys were found to be suitable for the more in-depth phone interviews.

Aim 1: An Estimation of the area of rape grown in Otago- Southland

It was difficult to get an estimate of rape grown in Otago and Southland due to all seed company representatives being unwilling to state what quantities of rape seed they sold on account of commercial sensitivities. One representative put the total rape grown in New Zealand at approximately 60,000ha.

Table 1: Proportion of rape varieties grown by respondents

Rape variety	Bonar	Goliath (rape ×kale)	Winfred	Leafmore	Titan (rape×kale)	Greenland	Interval	Hunter (rape×turnip)
% of respondents who had the variety	18%	7%	11%	14%	21%	7%	7%	14%

There was a range of rape varieties sown by the respondents of the survey. Titan and Hunter which are rape×kale and rape×turnip varieties respectively were some of the varieties grown by the respondents. Twenty one percent of respondents grew Titan (Table 1) making it the most popular variety grown by the survey respondents. This was followed by Bonar with 18% and Leafmore and Hunter both with 14%. Winfred, Goliath, Greenland and Interval were the other varieties mentioned in the survey responses.

Of the 38% of farmers who knew the yield of their rape crop in kg DM/ha the average yield was 6250kg DM/ha. Other farmers either did not know their yield (38%) or only knew their yield in terms of height (25%). This begs the question of how well the farmers in the survey were accounting for rape when feed budgeting.

Farm sizes ranged from 127 to 4800ha, while the area of rape sown on each farm ranged from 1-195ha. As a percentage of the total farm area, rape on average covered about 4% or 25ha of total land. In general this figure was higher in smaller farms (<500ha). This likely owed to the fact that the smaller farms had more effective area suitable for cultivation, and farm systems more aligned to finishing lambs on rape.

Aim 2: An estimation of the incidence and severity of rape scald in Otago-Southland

Of the 21 respondents who mentioned they had grown rape, 57% said that they had encountered rape scald issues. What must be taken into consideration is the fact that this survey is likely to have produced bias in its respondents. Farmers who have encountered rape scald in the past may be more likely to respond to the initial survey and agree to provide further information. Those farmers may have had a more vested interest in finding ways to reduce the impacts of rape scald.

Table 2: Rape scald severity in lambs on farms affected by the disease.

Severity	No visual symptoms	Mild symptoms	Moderate symptoms	Severe symptoms
Symptoms	None	Redness/swelling of face, ears or rump	Eczema to skin and/or secondary infection like flyblow to affected area	Deaths (due to secondary infections)
Avg. % of lambs grazing	87.2%	9.2%	3.5%	0.1%

Of the farmers who said they had encountered rape scald, on average 87.2% of their lambs were seen to have had no visual symptoms of the disease (Table 2). Nine point two percent of lambs were considered to have mild symptoms including redness/swelling of the face, ears or rump. Three point five percent experienced moderate symptoms with eczema to the skin and or secondary infection such as flyblow to the affected area. Deaths due to secondary infections of the disease accounted for a small proportion (0.1%) of lambs. As with most diseases, visual symptoms show only the tip of the iceberg in terms of impacts on animals. There could have been many cases of the disease which showed no visual symptoms but may have had other detrimental effects on performance.

A question about how well lambs grew on rape was also included in the phone interview. This was to help quantify one of the benefits of rape (which is added live weight gains in lambs in the finishing period relative to pasture). This would need to be weighed up against the potential cost of incurring rape scald in lambs. Responses from the farmers surveyed shed a favourable light on rape with only 13% of farmers mentioning that lambs performed worse on rape than on pasture. Most of the farmers who mentioned worse performance on rape said that it mainly occurred in the first few weeks of grazing. Thirty one percent stated that their lambs actually gained more weight on the rape compared to pasture, compared to 56% who did not know whether rape was better or worse. Once again the small response size (16 farmers) needs to be taken into account when analysing these results.

Aim 3: Identification of management practices that may be responsible for or mitigate rape scald

Meat New Zealand (2002) described the following practices which should limit detrimental effects of feeding rape to lambs including:

1. Ensure rape has ripened with purpled edges on leaves
2. Limit nitrogen application to 20-40kg/ha at sowing time. Use a follow up fertiliser if needed but do not apply within 4 weeks of grazing
3. Use low S fertiliser such as DAP or Urea prior to sowing
4. Have a slow introduction of rape to lambs
 - Run lambs for 1-2 hours a day initially (about 20% of diet)
 - Build up to 100% of diet by day 7-10 of introduction
 - Give supplementary feed such as 0.2kg straw per lamb while they graze
 - Or as an alternative allow the lambs to have a pasture run-off paddock

Farmers were questioned as to whether they knew of management practices which they believed either mitigated or were responsible for rape scald. This question was set to determine the understanding of best practices for rape scald and to see how successful the extension of that information was.

A range of management practices farmers perceived would reduce rape scald were received. However, 34% of respondents did not respond with any management practices they thought could reduce rape scald symptoms. This could either be because they did not want to answer the question or they did not know any management practices. The 66% of respondents who did come up with practices had their methods categorised into 6 broad categories illustrated in Table 3.

Table 3: Categories of management practices farmers perceived as being important for reducing rape scald and the proportion of farmers who chose each management practice.

Category	Introduce rape slowly	Care in N application	Wait for rape crop maturity	Introduce rape with alternative feeds	Variety of rape	Shift off crop as symptoms arise
% of farmers who knew management practices	15.4%	3.8%	34.6%	34.6%	7.7%	3.8%

Table 3 shows how many times farmers mentioned the 6 broad categories of management practices for reducing rape scald as a proportion of the total. Most of the best management practices for rape grazing mentioned by Meat New Zealand & Wrightson Ltd (2002) were mentioned by the farmers. This indicates a good level of extension of the best practices- at least to the 66% of farmers who answered the question.

Further questions were made in the phone interview to ascertain whether the knowledge of the best management practices was actually being extended into practice on the farm.

Table 4: Diet composition of lambs when grazing rape

Period after first grazing	Proportion of lambs diet as rape in survey	Recommended proportion
First 2 days	44%	20%
First 7 days	72%	100%

Many of the farmers found it difficult to estimate the proportion of rape being eaten in the first 2 days. Some farmers said they allowed lambs to run between the rape paddock and a pasture runoff while others sowed grass species with the rape. This corresponded well to point number 4 made by Meat New Zealand & Wrightson Ltd (2002). When farmer estimates were averaged (Table 4) it was found that lamb diets were approximately 44% rape in the first 2 days- significantly higher than the 20% recommended.

Farmers increased the proportion of the diet as rape after the first couple of days so that by the first week, 72% of the diet was rape. This is well under the 100% of diet as rape by day 7-10 as recommended by Meat New Zealand & Wrightson Ltd (2002). It indicates that farmers are willing to maintain alternative feeds for their lambs when grazing rape even after a week of grazing.

Table 5: Proportion of rape being grazed at each colour stage as mentioned by surveyed farmers

Rape colour when it was grazed as a % of total respondents				
Green	Green/blue	Purple/red tinges on leaf edges	Other	Didn't know
38%	13%	19%	0%	31%

Identifying rape maturity was commonly mentioned by farmers as a practice to reduce rape scald. Although, 31% (Table 5) of farmers did not know the colour of the rape when it was grazed, suggesting they either had forgotten or did not look for rape colour when assessing whether their rape was mature for grazing. Only 19% grazed their rape when it was in the recommended state of having purpled tinges on the leaf edges. Just over half either grazed when it was still green or green/blue. For some farmers this was because they did not realise that they should wait for longer until tinges appear on the edges before grazing. For others it was a matter of being forced to graze the rape when it was still green due to a lack of alternative pasture feed or the fact that the (wet) season had prolonged the maturity period and it just had to be eaten. This is understandable considering some farmers get away with grazing their rape early. The cost of the 12.8% (Table 2) of lambs that may have shown mild to severe rape scald symptoms may in fact outweigh the fact that rape could provide better finishing feed than pasture in some cases. Two farmers mentioned the fact that they ate the rape leaves to taste whether it was 'bitter' or 'sweet' tasting in order to judge whether the rape was immature or mature respectively.

Few (14%) famers tested soil for nitrogen or sulphate before sowing rape. This is probably attributed to the fact that many of the farmers sowed rape after another brassica crop like swedes (after old pasture). Most would have tested soil fertility levels before the old pasture was sowed into swedes.

On average 12kg of elemental sulphur was applied before or at sowing time, mainly as superphosphate. Only 0.125kg on average was applied as Diammonium phosphate (DAP) fertiliser post sowing.

Pre-sowing nitrogen was applied as mainly DAP at an average rate of 9 kg N/ha. There was a mix of Urea and DAP applied post sowing at an average rate of 32kg N/ha. There were farmers who commented that they applied the fertiliser well before first grazing or just after lambs had grazed the rape. This followed recommendation number 2 by Meat New Zealand (2002) well in that on average they did not apply over 40kg N/ha at or before sowing. Most farmers must have been aware not to apply nitrogen within 4 weeks of grazing.

(6) Discussion

A relatively high (57%) proportion of famers indicated that they had experienced rape scald in their lambs. This proportion needs to be treated with caution as it is likely that

the responses have been skewed toward those who have experienced the disease. Farmers who have had the disease would have more of an interest in research which aims to find ways of mitigating rape scald.

Only 12.8% of farms that experienced rape scald actually had lambs that showed visual symptoms. This is likely to have been the tip of the iceberg in terms of the proportion of lambs that were actually affected by the disease. Farmers may have overlooked some lambs with the symptoms, while some lambs without visual symptoms could still have experienced lowered performance that were not measured or noticed by the farmer. However, few (13%) farmers thought that rape caused lower lamb growth relative to lambs they had on pastures. Most of this lowered performance was said to occur in the first couple of weeks of grazing. Therefore this may have been caused by the lambs still adapting to the new source of feed rather than through rape scald.

Farmers were generally following the best management practices set by Meat New Zealand & Wrightson (2002). There was a high incidence of farmers recognising the importance of having a gradual introduction of rape to lambs diets and having alternative sources of feed. In practice, farmers may have been feeding more rape than was recommended in the first 2 days by Meat New Zealand & Wrightson (2002) (44% of diet compared to 20%). However, after the first 2 days, farmers generally allowed enough alternative feeds, generally as pasture sown with the rape or by having a pasture runoff available.

Thirty four percent of farmers either did not or could not list best management practices for grazing rape. This gives an idea of the level of improvement needed in extension of best management practices to farmers.

Farmers also thought crop maturity was an important factor for reducing rape scald with this being mentioned 34.6% of the time. This knowledge did not seem to be applied to on farm practice too well. Only 19% of farmers actually waited for the rape to become purpled on the leaf edges. Other novel methods such as the farmer actually tasting the rape leaves to see how 'sweet' or 'bitter' it was may have some credibility. But it is only based on anecdotal evidence so far.

Although feeding rape before it is 'mature' could lead to increased incidences of rape scald, in some cases it must be weighed against alternative scenarios which could be worse for farm profitability. Situations mentioned by some farmers, they thought justified early rape grazing including when a lack of alternative pastures (due to the dry) meant they were forced to graze it early. Dry conditions can help mature rape which could reduce the likelihood of rape scald anyway. Another scenario mentioned was if the season was very wet causing the rape crop to keep growing without maturation. This would be more likely to cause rape scald.

In each scenario, the cost of the alternative needs to be weighed up against feeding the rape before it is mature. For example the potentially lower lamb live weight gains if the lambs were kept on lower quantity and quality of feed in the drought versus the risk of rape scald if they were to be put onto an immature rape crop.

(7) Conclusions

While there was a poor initial survey response to this research, a willing group of farmers was found to provide more in depth information on rape scald.

Findings included the fact that rape scald is a significant issue for farmers in the Otago and Southland regions with over half the farmers who had grown the crop, experiencing the disease. The risk of rape scald was highlighted in this survey, as well as its benefits. Few farmers for example thought their lambs performed worse on rape in the long term compared to on pasture. While most of the best practices for preventing rape scald were generally acknowledged by farmers, they did not put all this knowledge into practice. Waiting for rape crop maturity and having a slower introduction of rape to lambs were two such practices which could be better implemented by farmers. However, even with the knowledge of how to recognise mature rape, farmers may still choose to graze it earlier if the potential cost of rape scald is outweighed by losses in lamb performance due to lack of alternative feeds.

(8) Contact point for more information

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(9) References

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