

# COGGO

Council of Grain Grower Organisations Limited  
ACN 091 122 039

## Final Report

### COGGO Research Fund for 2020 projects

A project completion report covering the project. The acceptance of a satisfactory report against the objectives of the project, and agreement on the sharing of any commercial returns and/or IP will trigger payment within 4 weeks, by COGGO for any outstanding payments.

This Final Report should be completed with reference to the Research and Intellectual Property Agreement (the Research Agreement) signed between the proponent and COGGO Pty Ltd.

## 1. Project information

Project title	Canola establishment - Is it improved through the application of wetters to the seed in marginal conditions?
Commencement Date	1 January 2020
Completion Date	31 January 2022

Name of Proponent	Facey Group Inc
ACN/Legal Name or ABN	59 136 484 550
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### COGGO Use Only

Project Number	
Date Received	

<b>2. Project results</b>	This section provides a final report against the Project Aim and the Planned Outputs for the Project.
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<b>Achievement of the Project Aim</b>	Brief statement of achievement in relation to the aim of the project
<p><u>Project Aim:</u></p> <p>1) To investigate the use of wetting agents, applied directly to canola seed to understand the impact it has on crop establishment and end of season yield in water repellent soils. The aim is to investigate an alternative application method to the current furrow and banded treatment of wetters; for ease of management directly coating the seed. The project will intend to find an alternative use option for wetters and reduce the amount of product required and changes to seeding system set ups.</p> <p>2) In addition to small plot on-ground trials we aim to investigate the application and impact on seed viability in a laboratory setting; with a range of seed dressings (fungicides, insecticides and trace elements) and wetters to identify whether there is any compatibility issues with product and test whether there is a time critical point for application prior to sowing.</p> <p><u>Achievement of project aim:</u></p> <p>1) The effect of wetting agent coated directly to canola seed on crop establishment and end of season yield was investigated through two field trails over the duration of this project. In both seasons of the project, a suitable field trial site with water repellent soil was identified for the field experiment. Various rates of wetting agent coated to canola seed was compared to various rates of in-furrow application. The wetting agents used in the 2020 trial included SE14, Watermaxx and Revolution, and the 2021 trial included SE14 and Bi-Agra Band. The trial sites for both seasons of the project received above average rainfall in the weeks following seeding and throughout the growing season. The early season breaks caused high soil moisture during the early crop establishment phase, which resulted in no treatment effect on crop establishment and yield. In-season assessments included crop emergence, NDVI, biomass and grain yield and quality. There was no clear agronomic or economic benefit of any treatment in either season of the project.</p> <p>The wetter cost for seed treatment is less than \$0.50/ha, making it suitable for use in years when the water repellence constraint is low. The cost for furrow application of wetting agent however ranges between an average of \$7-35/ha. With increased climate variability and the unpredictability of early season rainfall, many producers are beginning to invest in in-furrow application of wetting agents in an attempt to limit production losses following small early season rainfall events on non-wetting soils. In seasons with adequate rainfall however, as seen in 2020 and 2021 of this trial, the high cost of in-furrow wetter applications is unlikely to pay off, if no increase in crop production results. Applying wetting agents to the seed potentially offers producers a low-risk way of mitigating against water repellence constraints without the high economic input of in-furrow wetter application.</p> <p>2) Growth experiments and compatibility tests were undertaken in a laboratory setting to determine seed viability following coating with wetter and a range of seed dressings. In the 2020 field trial, reduced germination was observed when high rates of Revolution® was coated onto the seed, however the reduction was not significant. A reduction in germination percentage was also observed in the growth cabinet study. However, glasshouse germination was not correlated to plant density observed in the field experiment. This indicates there was some effect of soil water repellence on germination under field conditions.</p> <p>In 2021, surfactant and glue treatments had no effect on germination (90-96%) when planted immediately after the seed treatment. Cold room storage for 9 months resulted in a decline in germination however, with the greatest decline seen in seed coated with Bi-Agra Band plus glue. This experimented also compared iLevo (fungicide), Poncho (insecticide) and Bi-Agri Band (surfactant) when coated to the seed together with glue, or coating them in separate layers. Applying product in separate layers reduced the interacting toxic effects of seed treatments. However, it required the seed treatment to be done in a rotatory seed treatment machine, which may cause limitations to the availability of coated canola seed for commercial producers in the short-term. The highest germination was for the Poncho treated seed (88%), while the lowest germination occurred when Poncho was mixed with Bi-Agri Band (78%) and applied in a single layer.</p> <p>Overall, the findings of this two year project indicate that wetting agent can safely be coated to canola seed, particularly when coated in separate layers. Ideally, seed should be coated prior to seeding, and not stored following coating for use in following seasons. In wet years with high early season rainfall, wetting agent application method and rate did not appear to significantly impact on any crop measures, including germination and yield. These findings are significant to producers as the cost investment on applying large quantities of wetting agent at seeding may not pay off during seasons with an early break.</p>	

<b>Project Outputs</b>	Please provide a report on the achievement, or otherwise, of the project outputs as per the planned outputs provided in the Project Proposal.
1	<p>-</p> <p>Output 1 (from Project proposal)</p> <p>Improved understanding of how different wetters affect crop establishment and yield as a seed coating; in comparison to recommended furrow or banding treatments in canola; across water repellent soils in WA.</p>
	<p>Various wetting agents were investigated as a seed coating over the duration of this project in field trials including SE14, Bi Agra Band, Revolution and Watermaxx. SE14 and BiAgra Band were also applied in-furrow for comparison, along with control treatments with no wetter application. Trial sites with sandy soil texture and high organic matter content, resulting in water repellence, were identified for the project.</p> <p>The two seasons of the trial indicated that the use of wetting agents when coated the seed, did not result in an increase in canola germination or yield compared to in-furrow application or nil (control) wetting agent, in seasons with a significant post-seeding germinating rainfall. There was no clear difference between wetting agent type or application method compared to the control, which did not have any wetting agent applied. In 2020, high rates of revolution when coated to the seed caused an observable reduction in germination in the field trial, however the reduction was not statistically significant. The laboratory experiments indicated that a reduction in canola germination would occur in-field if coated canola seed was stored for an extended period of time prior to planting.</p> <p>Seasonal conditions unfortunately did not allow for crop germination, growth and yield comparisons between wetter application methods and rates during seasons with later autumn breaks or low growing season rainfall. However, the growth cabinet experiments indicated that wetting agents can safely be coated to canola seed without reducing seed viability, and this correlated with the results of the field studies. The results of this study has laid groundwork for further research into seasons with variable conditions.</p> <p>The findings from this project highlight the importance to producers of monitoring weather forecasts and base wetting agent application decisions regarding application accordingly. The lack of effect of wetting agent brand on crop measurements indicates that the return on investment of higher priced wetting agents may not pay off in years with high growing season rainfall.</p>
2	<p>-</p> <p>Output 2 (from Project proposal)</p> <p>Increase awareness of the economic and agronomic benefits of different application techniques (banding, furrow or seed coating) of wetters from sowing, establishment and through to yield.</p>
	<p>Various in-season measurements were collected to determine the impact of wetting agent application method and rate on crop growth. Establishment counts, NDVI at 6 week and 14 weeks post sowing, biomass and grain yield and quality were assessed. There was no significant correlation between wetting agent brand, rate or application method on crop germination, growth or yield in the field trials. The results from this research has indicated there is little agronomic benefit of wetter application in seasons with high growing season rainfall. Wetting agents can increase nutrient uptake by seedlings in addition to reducing water repellency constraints, however this benefit did not correlate to increased grain yield in this project. Economic analyses were conducted in both seasons of this project. The gross margin of each treatment was highly variable across both seasons, due to lack of treatment effect on grain yield.</p> <p>The wetter cost for seed treatment is less than \$0.50/ha, making it suitable for use in years when the water repellence constraint is low. The cost for furrow application of wetting agent however ranges between an average of \$7-35/ha. With increased climate variability and the unpredictability of early season rainfall, many producers are investing in in-furrow application of wetting agents in an attempt to limit production losses in seasons with poor germinating rainfall, particularly in non-wetting soils. In seasons with adequate early rainfall however, as seen in 2020 and 2021 of this trial, the high cost of in-furrow wetter applications is unlikely to pay off, when there is no subsequent benefit to crop production. Applying wetting agents to the seed potentially offers producers a low-risk way of mitigating against water repellence constraints without the high economic input of in-furrow wetter application.</p>
3	<p>-</p> <p>Output 3 (from Project proposal)</p> <p>Improved understanding of interactions of wetters (applied to seed) and common seed dressings; impact on seed viability and product compatibility through economic analysis and reporting.</p>
	<p>The seed growth and compatibility experiments that occurred throughout this project have provided valuable research on the effect and interaction of wetting agents and seed dressing</p>

	<p>treatments on canola establishment. The research in this project has indicated that SE14, Bi-Agra Band and Watermaxx surfactants and glue can be safely coated to canola seed immediately prior to seeding without impacting on germination. Revolution surfactant may slightly reduce canola germination if coated at a high rate. Furthermore, germination of canola seed was found to decrease following cold room storage for 9 months, with the Bi-Agra band and glue treatments having the greatest decline (69-85%).</p> <p>Two seed coating methods were evaluated, one where surfactant and seed treatments (iLevo fungicide and Poncho insecticide) were coated to the seed together compared to coating in separate layers. Applying the products in separate layers reduced the interacting toxic effects of seed treatments. However, it required the seed treatment to be done in a rotatory seed treatment machine, which makes this option more difficult for growers. The highest germination was for Poncho treated seed (88%), while the lowest occurred when Poncho was mixed with Bi-Agra band and applied in a single layer (78%).</p> <p>The different seed coating methods and wetting agent brands did not correlate to a statistical difference in canola emergence or grain yield. There was high yield variation within treatments across both seasons of the project. As a result, the economic analyses conducted in each season did not lead to the identification of a clear, economical treatment option. The gross margin values within each treatment were highly variable. Instead, the project results have highlighted the importance of producers monitoring weather conditions and seasonal forecasts, and consider reducing wetting agent application rates in seasons with high early season rainfall.</p> <p>Further research is required into the agronomic and economic impact of wetting agent application methods and rates in seasons with lower growing season rainfall and small early season rainfall events, which the two seasons of this project were unable to offer investigation into.</p>
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<p><b>Project results</b></p>	<p>This project aimed to investigate the impact of coating wetting agents to canola seed, compared to in-furrow application or nil-wetter control treatments, on canola establishment and grain yield. Two field trials were undertaken in water repellent sandy soils in WA's medium rainfall zone. Wetting agents trialed as a seed treatment across the duration of this trial included SE14, BiAgra Band, Revolution and Watermaxx, with Bi Agra Band and SE14 also applied at various rates in furrow.</p> <p>The trial sites in both seasons of the project received above average growing season rainfall, including significant germinating events post-seeding. Various in-season measurements were collected to determine the impact of wetting agent application method and rate on crop growth. Establishment counts, NDVI at 6 week and 14 weeks post sowing, biomass and grain yield and quality were assessed. Across both seasons, there was no significant correlation between wetting agent brand, rate or application method on crop germination, growth or yield in the field trials. In the 2020 field trial, reduced germination was observed when high rates of Revolution® was coated onto the seed, however the reduction was not significant. A reduction in germination percentage was also observed in the growth cabinet study. However, glasshouse germination was not correlated to plant density observed in the field experiment. This indicates there was some effect of soil water repellence on germination under field conditions, and that there may be significant effects of wetting agent application method and rate in seasons with lower germinating rainfall events.</p> <p>Two methods of coating wetting agent to canola seed were evaluated in this project, one where surfactant and seed treatments (iLevo fungicide and Poncho insecticide) were coated to the seed together with glue, compared to coating in sperate layers. Applying the products in separate layers reduced the interacting toxic effects of seed treatments. However, it required the seed treatment to be done in a rotatory seed treatment machine, which makes this option more difficult for growers. The highest germination in the laboratory experiment was for Poncho treated seed (88%), while the lowest occurred when Poncho was mixed with Bi-Agra band and applied in a single layer (78%).</p> <p>The seed growth and compatibility experiments that occurred throughout this project have provided valuable research on the effect and interaction of wetting agents and seed dressing treatments on canola establishment. The research in this project has indicated that SE14, Bi-Agra Band and Watermaxx surfactants and glue can be safely coated to canola seed immediately prior to seeding with minimal impact on germination. Revolution surfactant may slightly reduce canola germination if coated at a high rate. Furthermore, germination of canola seed was found to decrease following cold room storage for 9 months, with the Bi-Agra band and glue treatments having the greatest decline (69-85%).</p> <p>Overall, the results from this research has indicated there is little agronomic and economic benefit of wetter application in seasons with high growing season rainfall. Wetting agents can increase nutrient uptake by seedlings in addition to reducing water repellency constraints, however this benefit did not correlate to increased grain yield in this project. Economic analyses were conducted in both seasons of this project. The gross margin of each treatment was highly variable across both seasons, due to lack of treatment effect on grain yield and high variability within treatments. As a result, the economic analyses conducted in each season did not lead to the identification of a clear, economical treatment option. Instead, the project results have highlighted the importance of producers monitoring weather conditions and seasonal forecasts, and consider reducing wetting agent application rates in seasons with high early season rainfall.</p> <p>Full trial results and analysis of the 2020 and 2021 season experiments are detailed in the respective 2020 and 2021 trial reports and progress reports. Further research is required into the agronomic and economic impact of wetting agent application methods and rates in seasons with lower growing season rainfall and small early season rainfall events, which the two seasons of this project were unable to offer investigation into.</p> <p>Intellectual Property: Professor Madsen (Brigham Young University, USA) has published the details outlining the surfactant seed coating technique. It is registered as a patented technique US 2010/0267554 A1. DPIRD has modified this technique so that it is suitable for use for seed coating agricultural species for seeding in a no-till farming system.</p>
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<b>3. Project resources</b>	This section describes use of the funding listed in the initial plan and any refunds due to COGGO
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Expenditure of funds requested from COGGO	\$ Total funds budgeted	\$ Total funds expended (actual)	\$ Total funds requested from COGGO*	\$ Total COGGO funds expended	\$ Refund due to COGGO of any unexpended COGGO funds
Salary/Contractors	82758	82758			
Operating costs	66370	66370			
Capital	0	500			
<b>TOTAL</b>	<b>149628</b>	<b>149628</b>			

\*Funding provided by COGGO.

IMPORTANT: Return of unused funds to COGGO is required as per *Clause 3.3* of the Research Agreement.

<b>4. Commercialisation</b>	<p>Insert details of the proposed commercialisation process, as applicable, with reference back to the planned commercialisation plan in the project proposal) for any outputs from the project.</p> <p>This should include recommendations for the commercialisation of the results of the project and the registration or other protection of Project IP and Project Confidential Information as per the Research Agreement.</p>
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N/A as per proposal.
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It is understood that this may require further discussion and agreement with COGGO via its' agent GIWA, as per the undertakings given and terms agreed, in the project proposal. This can be the subject of an appended letter and attachments. In all cases such discussion and subsequent agreements need to be governed by *Section 8 Project IP, Improvements and Project Confidential information* of the Research Agreement.

<b>5. Communication/ Extension</b>	<p>Insert details of how the communication and extension of the project outcomes has been achieved to date and recommendations for future activities to disseminate and promote adoption of the results of the Project.</p>
<p>Extension of the project has been ongoing throughout the 2020 and 2021 seasons of the project, through various formats. The project has featured in multiple Facey Group newsletter articles, which are available to both Facey</p>	

Group members and the general public. Various social media posts have centered around the project across Facebook and Twitter. Social media links are included in the progress reports.

Technical reports have been distributed twice per year, located in the spring field walk and research updates booklets. These booklets were distributed to event attendees and sent to the remaining Facey group members, and will be made publicly available on the Facey Group website.

The project is featured on the 'current project' section of Facey Group's website, which outlines key information relating to the project and is accessible to the general public.

The project was a feature of the 2020 Spring Field Day, where the trial site was viewed and Dr Geoff Anderson (DPIRD) discussed the seed coating methods with field walk attendees. Dr Geoff Anderson also attended the 2021 trial updates to extend the project to interested growers in attendance.

Facey Group will continue extending the results of this project. Current plans include a podcast and summary of the project which will be distributed to Facey Group members and will also be available to the public.

Note: As per *Clause 7.3 (b) (ii)* of the Research Agreement COGGO may require the Researcher to produce an edition of the Final Report in a form suitable for general distribution. If so required by COGGO, the Researcher must produce a non-confidential version of the Final Report within 28 days of receiving a request to that effect from COGGO.

## 6. Certification

The Project Supervisor and the Research Organisation certify that all information contained in, and forming part of, this final project report is complete and accurate. The project supervisor and research organisation further warrant that the project complied with all the relevant guidelines affecting the conduct of research, for example in relation to ethics, bio-safety, environmental legislation, GMAC or National Health and Medical Research Council Codes.

Project Supervisor's signature

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AMY BOWDEN

Date: 30/3/22

Research Organisation signature

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DR. KELLY PEARCE

CHIEF EXECUTIVE OFFICER

Date: 30/3/22

### Completed Final Project reports

Email to [coggoresearchfund@giwa.org.au](mailto:coggoresearchfund@giwa.org.au) or mail to  
COGGO Research Fund, GIWA, PO Box 1081, Bentley DC, WA 6983

For any further enquiries please email questions to [coggoresearchfund@giwa.org.au](mailto:coggoresearchfund@giwa.org.au)

Or phone (08) 6262 2128

### COGGO representative

For the purpose of this Project agreement contract, COGGO will be represented by Grains Industry Association of Western Australia (GIWA), or such other representative that is nominated by COGGO as authorised to operate on behalf of COGGO.



## **PROJECT SYNOPSIS SUITABLE FOR GENERAL PUBLICITY AND COGGO WEBSITE**

Facey Group, in collaboration with DPIRD, has spent two seasons investigating the suitability of seed-coating wetting agents to canola seed to improve crop establishment and grain yield in non-wetting soils. The project, funded by the Council of Grain Grower Organizations, compared various rates of surfactant coated to the seed and applied in-furrow, along with control treatments containing no wetting agents in the medium rainfall zone of WA. Wetting agents evaluated in the project included SE14, BiAgra Band, Watermaxx and Revolution. The project also aimed to improve the understanding of the interactions of wetters and common seed dressings on seed viability when coated to the seed.

The 2020 and 2021 growing seasons both had high growing season rainfall with large post-seeding germinating rainfall events. Therefore, wetting agent when applied to the seed or banded in furrow did not increase canola establishment or grain yield compared to the nil-wetter control in the field trials in both seasons of the project. In the 2020 field trial, reduced germination was observed when high rates of Revolution® was coated onto the seed, however the reduction was not statistically significant. A reduction in germination percentage was also observed in the growth cabinet study. However, glasshouse germination was not correlated to plant density observed in the field experiment. This indicates there was some effect of soil water repellence on germination under field conditions, and that there may be significant effects of wetting agent application method and rate in seasons with lower germinating rainfall events.

Economic analyses were conducted following both seasons of the project. In 2020, canola yield ranged from 1.10 to 1.35t/ha. In 2021, yield ranged between 2.09 and 2.89t/ha. Due to the lack of treatment effect on grain yield and high variability within treatments, the economic analyses conducted within each season did not lead to the identification of a clear, economical treatment option for season with high early season rainfall. Instead, the project results have highlighted the importance of producers monitoring weather conditions and seasonal forecasts, and consider reducing wetting agent application rates in seasons with high early season rainfall.

Seed growth and compatibility experiments were undertaken throughout the project, and provided valuable insight on the effect and interaction of wetting agents and seed dressing treatments on canola establishment. The research in this project indicated that SE14, Bi-Agra Band and Watermaxx surfactants and glue can be safely coated to canola seed immediately prior to seeding without impacting on germination. Revolution surfactant may slightly reduce canola germination if coated at a high rate. Furthermore, germination of canola seed was found to decrease following cold room storage for 9 months following seed coating, with the Bi-Agra band and glue treatments having the greatest decline (69-85%).

Two seed coating methods were evaluated, one where surfactant and seed treatments (Bi Agra Band, iLevo fungicide and Poncho insecticide) were coated to the seed together compared to coating in separate layers. Applying the products in separate layers reduced the interacting toxic effects of seed treatments. However, it required the seed treatment to be done in a rotatory seed treatment machine, which makes this option more difficult for growers. The highest germination was for Poncho treated seed (88%), while the lowest occurred when Poncho was mixed with Bi-Agra band and applied in a single layer (78%).

The wetter cost for seed treatment is less than \$0.50/ha, making it suitable for use in years when the water repellence constraint is low. The cost of furrow application of wetting agent however ranges between an average of \$7-35/ha. With increased climate variability and the unpredictability of early season rainfall, many producers are investing in in-furrow application of wetting agents in an attempt to limit production losses in seasons with poor germinating rainfall, particularly in non-wetting soils. In seasons with adequate early rainfall however, as seen in 2020 and 2021 of this trial, the high cost of in-furrow wetter applications is unlikely to pay off, when there is no subsequent benefit to crop production. Applying wetting agents to the seed potentially offers producers a low-risk way of mitigating against water repellence constraints without the high economic input of in-furrow wetter application. Further research is required into the agronomic and economic impact of wetting agent application methods and rates in seasons with lower growing season rainfall and small early season rainfall events, which the two seasons of this project were unable to offer investigation into.

Facey Group would like to thank the Council Of Grain Grower Organizations for funding this research, and local producers Geoff Poultney and Scott Young for hosting the field trial sites. Thank you to DPIRD for their technical support, and SLR and Trialco for undertaking site operations.



*Facey Group’s 2021 COGGO canola wetter trial site located at East Pingelly, WA.*



*TrialCo harvesting Facey Group’s 2021 COGGO canola wetter trial site located at East Pingelly, WA.*