

October 23, 2020

David Jennings, Director  
Fisheries, Forestry and Agriculture  
PO Box 2006  
Corner Brook, NL  
A2H 6J8

Dear Mr. Jennings:

As per your request, the Farm Industry Review Board has completed a thorough assessment of farm practices applied at the FFA Malting Barley Research Project in Pasadena, and made a determination to the status of these farm practices as per Section 16 of the Farm Practices Protection Act.

The enclosed final report provides details of practices employed and resulting crop management decisions. This review concludes all agri-environmental farm practices utilized at the Pasadena Research Project, including the decision to abandon the crop, are acceptable farm practices in the industry and therefore not liable in action as per Section 3(1) of the Farm Practices Protection Act.

This report is being presented by the Farm Industry Review Board to David Jennings, Director, Fisheries, Forestry and Agriculture to use for any relevant purpose at his discretion.

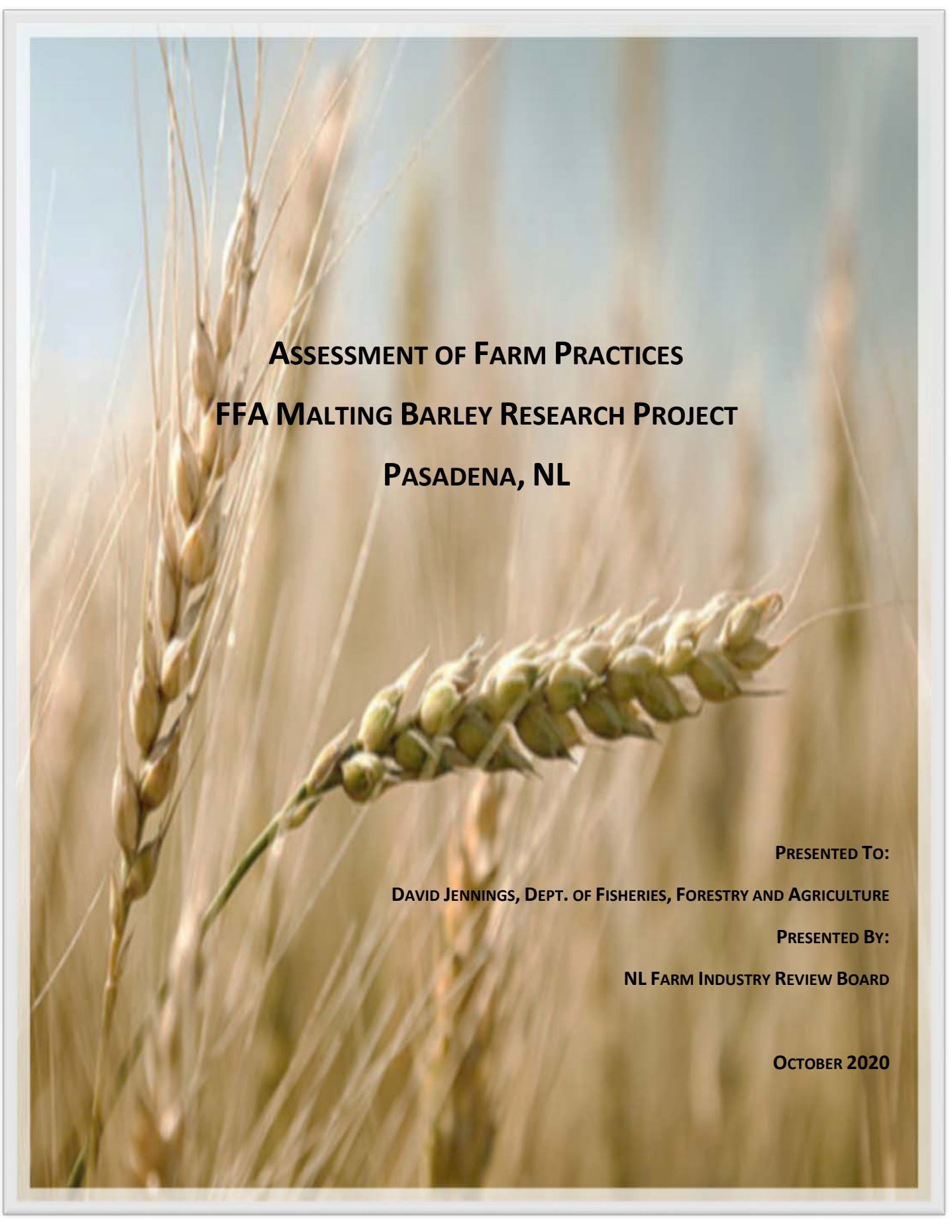
Sincerely,

A handwritten signature in blue ink that reads "Rita Legge".

Rita Legge  
Chair, Farm Industry Review Board

Enclosure

C: Roosevelt Thompson (Board Member)  
Kevin Harte (Board Member)  
Donald MacInnis (Board Member)  
Paul Lomond (Board Member)



**ASSESSMENT OF FARM PRACTICES  
FFA MALTING BARLEY RESEARCH PROJECT  
PASADENA, NL**

**PRESENTED TO:**

**DAVID JENNINGS, DEPT. OF FISHERIES, FORESTRY AND AGRICULTURE**

**PRESENTED BY:**

**NL FARM INDUSTRY REVIEW BOARD**

**OCTOBER 2020**

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## 1 INTRODUCTION

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The following report has been prepared in response to a request received from Mr. David Jennings, Director of Agriculture Production and Research Division (APRD) with the Department of Fisheries, Forestry and Agriculture (formerly Department of Fisheries and Land Resources) on May 25, 2020, by the Farm Industry Review Board (FIRB), as per section 16 of the *Farm Practices Protection Act* (FPPA).

It was requested FIRB undertake a review of the circumstances surrounding the crop failure and abandonment at the APRD research project on a parcel of land in Pasadena owned by Green Acres Farm Ltd. (David Atkinson) and leased by Hammond Farm Ltd. (Bruce, Keith, & Wayne Simmons). The request specified an investigation to examine actions taken and all related issues to determine if the project was carried out properly and if other measures could have been implemented. The review was requested in response to complaints from some local residents of damages to their property caused by an infestation of rodents attracted to the area by crop left in the field November, 2019.

The Farm Industry Review Board (the Board) is a regulatory and adjudicative body, part of whose mandate, is to administer the *Farm Practices Protection Act*. This Act protects farms that carry on farm operations according to acceptable farm practices. Section 3 states:

*3. (1) A person who carries on a farm operation according to acceptable farm practices is not liable in an action in nuisance to a person for an odour, noise, dust, vibration, light, smoke or other disturbance resulting from a farm operation and shall not be prevented by injunction or other order of a court from carrying on a farm operation because it causes or creates an odour, noise, vibration, dust, light, smoke or other disturbance that would otherwise constitute grounds for an action in nuisance.*

*(2) Subsection (1) does not exempt a person from compliance with an Act of the province or of Canada or a regulation made under an Act of the province of Canada.*

*(3) Notwithstanding subsection (1) or (2), or another Act or regulation, a person does not contravene a municipal by-law with respect to nuisance if he or she conducts his or her farming operation according to acceptable farm practices.*

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The Board, under the authority of the FPPA, reviewed the practices that were utilized during the research project to determine if they met the requirements of acceptable farming practices; farm practices of the research project to be reviewed in detail further in this report

This report outlines the components of the assessment and the resulting conclusions and subsequent recommendations of the Board.

## **2 METHODOLOGY**

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In the preparation of this document, the Manager of the Farm Industry Review Board travelled to the research field in question located adjacent to Main Street in Pasadena; see Appendix A for geographic maps. This review was requested after the 2019 crop season was passed and after the initial preparation of fields for the 2020 cropping season was completed so the ability to perform a visual inspection of the crop fields was limited; Appendix B demonstrates photos of the research field at that time.

All pertinent information was gathered to assist in making a determination. Information utilized in this assessment encompasses federal and provincial government body documentation including that found on Government of NL website, Agriculture and Agri-Foods Canada website, the NL provincial Report of the Task Force on Agrifoods, as well as other various websites relevant to the production of malting barley and abandonment within the Canadian agriculture industry.

In order to assess the farm practices of the project an analysis of the above information was undertaken by the Farm Industry Review Board in conjunction with appropriate agricultural specialists. The following sections of this report outline the agricultural practices utilized during the project, discuss the options and resulting decisions made, and presents the findings of the Farm Industry Review Board with regards to the farm practices utilized during the FFA Malting Barley Trial Research project in Pasadena in 2019.

## **3 OVERVIEW OF RESEARCH DEVELOPMENT PROJECT**

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The Report of the Task Force on Agrifoods was a year-long study completed by and published in NL in 1991. The directive of this joint industry task force was to prepare a document for government which outlines an agrifoods policy and strategy for the future. As a result of a

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recommendation contained within this report the Agrifoods Division of the Government of NL has been leading varietal adaptation trials on farms in different regions of the province as part of a continuing research program in the province for nearly three decades.

The research project in Pasadena was undertaken as a joint venture between a farmer and the APR Division. Like previous research projects, there was no formal agreements in place for the venture but the understanding between the parties required the farmer to provide the land base and APR Division provided the material inputs (seed, fertilizer), as well as the equipment and the labour, if needed. At project end, this symbiotic arrangement has provided the Division with valuable knowledge on growing a particular crop in various areas of the province and the farmer has always procured the resulting crop for use or sale.

The farmer involved in this project was Wayne Simmons of Hammond Farm Ltd. which is co-owned by Wayne, Keith and Bruce Simmons and they contributed a parcel of land in Pasadena they had leased from Green Acres Farm Ltd. owned by David Atkinson.

Fifteen acres of Cerveza malting barley were planted in the Pasadena field on June 9, 2019. The malting barley was a certified seed purchased from Cavendish Agri Services Limited (Cavendish) in Truro, NS. Cavendish is a well-established Canadian company serving growers in Atlantic Canada and the United States. Certified seed is true-to-type. That means the crop it produces is predictable in terms of yield, lodging, disease resistance, maturity and other key characteristics. A fertilizer formulation of 19-11-21 (nitrogen-phosphorous-potassium) was applied to this field at a 375 pounds per acre rate as was recommended by the vendor.

In the 2019 crop year the same arrangement was also made with various other farmers in the province to partner in a research project including one other on the west coast to grow the same variety of malting barley grown as that at this location with a complete harvest possible due to more favorable growing and harvesting conditions.

## **4 CROP AND WEATHER CONDITIONS**

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The unfavorable growing season delayed the growth and maturation of the crop to the point where it could not be harvested due to snow coverage on the fields as is illustrated in the photos in Appendix D. Malting barley like all plants require a minimum temperature to progress through its life stages. If temperatures are lower, plant rate of growth is slowed until temperatures are too low to allow any growth.

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Generally the weather during the 2019 crop year was cool and wet throughout the entire province and many farmers reported their crops failed to produce as expected. The NL Crop Insurance Agency experienced an increase in indemnity payments for crop losses under the AgrilInsurance program as a result of inadequate growth, decreased yields and abandonment of crops due to poor germination.

After the planting in the late spring the malting barley crop at the Pasadena site exhibited no major growing issues but failed to grow to maturity by the expected date due to the cool, wet conditions. The Cerveza variety of crop is listed by vendors to mature within 90-100 growing days under typical growing conditions. This estimation is based heavily on the growing conditions in western Canada where the majority of wheat is farmed. This means the crop planted on June 9 ideally should have been ready for harvest after mid-September. In 2019 the province experienced low temperatures and high levels of precipitation. Historical weather data obtained for Corner Brook (see Appendix C), the closest Environment Canada weather station to Pasadena details the temperatures and above average amounts of precipitation experienced from June 9, 2019, to November 21, 2019; the period from planting until the second harvesting attempt failed.

According to the Barley Council of Canada barley is typically ready to harvest when the stalks and heads have turned from green to yellow and the seed heads have begun drooping towards the ground. A photo taken on November 4, 2019, (Figure 5a in Appendix D) show signs of green on the lower stalks illustrating the crop was not mature as of that date and could not be harvested.

On November 14, 2019, the harvester made an initial attempt to reap the barley but the amount of snow coverage made any attempt impossible as is verified in Figure 6, Appendix D. On November 21, 2019, after the second attempt to harvest the barley was derailed it was decided that it wouldn't be possible to get the machine to harvest the crop this calendar year due to the wet conditions. The wheat harvester was unable to harvest the wet crop because instead of cutting the stalks the stalks would wind around the header as is verified in Appendix D, Figure 7.

Once FFA staff realized harvesting was not an option for the 2019 year they contacted Mr. Simmons to let him know the status of the crop. As per the verbal agreement, the crop is owned by the farmer so the decision of what to do with it was his at that time but the snow limited his choices as well. He was displeased with the situation as he had already secured a customer for the product. At that time FFA offered to return in the spring to reseed the fields with a forage as compensation for what he had lost and he agreed. He didn't ask FFA to plow the fields at that time because of the field conditions and the possible damage. FFA indicated they spoke with Mr. Simmons mid-winter and suggested to possibly look at the fields again in the spring to see if there was any crop to be salvaged after overwintering.

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## 5 ACCEPTABLE FARM PRACTICES

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Some residents of the Town of Pasadena have asserted they experienced damages to their vehicles in storage in the building adjacent to the research trial field on Green Acres Farm Ltd. due to the abandonment of the malting barley crop in the field. They assert the abandoned crop provided an easily accessible food source for rodents and attracted them to the area and as a result the building became infested with rodents that damaged their vehicle; mainly to the wiring components. Accordingly, it is inferred that the residents consider the abandonment of a failed crop to have caused the rodent nuisance, and as such, this farm practice is the subject of this assessment.

As outlined in section 2(a) of the *Farm Practices Protection Act*:

*2(a) “acceptable farm practice” means a farm practice that is conducted in a prudent and proper manner that is consistent with*

- *accepted customs and standards followed by similar farm operations under similar circumstances*
- *the farm practices guidelines prescribed by the minister, and*
- *a policy directive issued by the minister,*
- *and includes the use of innovative technology in a manner consistent with acceptable farm practices.*

For the purposes of this report, acceptable farm practices are those that are consistent with the farm practices utilized within the agriculture industry in the province and elsewhere in the country.

## 6 RODENT COMPLAINTS

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In April 17, 2020, Wayne Simmons contacted Sabrina Ellsworth, Manager of Agricultural Research, to indicate there was evidence of rodents in the research field and building adjacent to the field. In particular, he detailed signs of tracks and burrows in the snow were noted. In response, on April 18, 2020, in an effort to quickly address the issue Ms. Ellsworth contacted

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Modern Pest Control Services Ltd. (MPCS), a local pest control company with more than 40 years of experience, to investigate the field and report their findings.

April 18, 2020, the employee from MPCS inspected the snow covered fields. He noted significant signs of rodent presence including numerous burrows in the field. He also entered the adjacent building (seen in Appendix B, Figure 4) and noted evidence of rodents in the building and while removing a tarp from one of the vehicles in storage a rodent was seen. The MPCS employee reported back to Ms. Ellsworth and provided an estimate to start a control protocol. On April 21, 2020, MPCS was given approval to proceed with control measures and place a heavy trap line of 300 diameter around the building. In the field they filled the burrows to cutoff the food source and followed up every other day to reassess and respond similarly to control the population.

MPSC commented, in general, rodents are in every community, but farming areas are ideal conditions for rodents as they offer soft soil for tunneling and if protected by the snow with an available food source, they will breed. He also commented MPSC have had an increased number of calls from areas surrounding Pasadena in recent years which indicates there has been an increase in the rodent populations which would naturally migrate over time.

May 4, 2020, Wayne Simmons again contacted Sabrina Ellsworth to report he had calls from individuals who claim they were renting space in the buildings adjacent to the research field to store their vehicles for the winter and the rodents had caused significant damages to their vehicles and they were looking for compensation from FFA.

May 11, 2020, Ms. Ellsworth offered to have FFA staff visit the field to plow the field to turn the crop into the soil. Mr. Simmons agreed and the field was completed immediately. FFA also offered to reseed the field to prepare it for planting for Mr. Simmons but he opted to accept the seed but complete the seeding himself.

May 20, 2020, Mr. Jennings attempted to contact David Atkinson to discuss the situation in the building but was unable to reach him. Subsequently Mr. Jennings and Keith Deering, Assistant Deputy Minister with FFA, spoke with Mr. Atkinson at which time Mr. Atkinson indicated it was entirely the fault of FFA and he was accepting no responsibility for the situation or the damages incurred. At that time, he also refused to discuss the details of the rental arrangements in the building with FFA staff.

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## 7 CROP MANAGEMENT

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Once it is established that a crop cannot be harvested proper crop management guidelines would be reviewed to decide the best course of action for that particular crop. Generally once barley cannot be harvested there are two options: abandonment or overwintering.

Abandonment simply means to leave the crop in the field and allow it to decompose into the soil. Sometimes when abandoning the farmer may choose to till the crop to break up the material and integrate it into the soil. While tilling the crop would be recommended it is only a choice where the ground is dry enough to withstand the weight of the equipment and would not damage the fields for future use.

Overwintering is allowing the crop to remain as is in the field with the intention of returning to the crop after the winter to assess it for any nutritional use and the possibility of harvesting. In central and western areas of Canada where the climate sees more frost and less snow, overwintering is quite common and often a feasible plan whereas on the east coast of Canada it is less of an option due to the abundance of snow fall and perpetual snow cover of the winter season. The intention is to leave the crop as is in the fall and after the spring thaw the grower reassesses the crop for condition and value to determine if harvesting is a practical and financially viable option. Sometimes overwintering causes little damage and the crop can be harvested and sold as a lower value crop. Sometimes the crop in the spring cannot be harvested or if it can be taken by the harvester the value may have degraded to the point where it would cost more to harvest than the finished product be worth at market.

Crop abandonment is a valid and accepted practice in farming as is evidenced in the prevalence to which it is referred, monitored and compensated. Agriculture and Agri-Food Canada monitors various aspects of production, including abandonment, and reports on them regularly. The AAFC Reports and Statistics Data for Canadian Principal Field Crops includes an ongoing measure of the how much each crop has varied from the “normal abandonment rate” for a given period validating the common use of abandonment as an acceptable farm practice.

Also private, federal and provincial government supported crop insurance programs exist in all provinces across the country and internationally to compensate participating farmers for losses realized on abandoned, non-viable crops as a result of natural perils beyond their control. All provincial insurance programs are similar in their mandate and the coverages they provide. The NL Crop Insurance Agency has been in place since the 1970s and is intended to help farmers manage the inherent risks of crop production against the effects of drought, excessive moisture,

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wind, frost, hail, snow, wildlife, disease and insects and they provide compensation to insured producers for abandoned crop.

## **8 CONCLUSION**

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This report has made no attempt to discuss the appropriateness of the on-farm building being utilized as a storage building for vehicles. The FPPA only gives the FIRB authority to review and consider complaints of a person aggrieved by an odour, noise, dust, vibration, light, smoke, or other disturbance resulting from a farm operation in the context of whether it was a result of an acceptable farm practice and therefore not liable under the FPPA legislation.

However, the Board do suggest when an individual utilizes a storage space to store their belongings they should inquire as to whether or not the rental agreement includes insurance against all potential perils. Even with advanced security features, no one can guarantee that a facility is 100% safe. If insurance is not part of the rental agreement then an individual would be prudent in securing insurance coverage elsewhere for the time the item is in storage. Many options exist for such coverage such as renters insurance or an addition to an existing homeowners' insurance which will cover your belongings in a storage unit.

Research trials of many varieties and commodities are carried out so as to gain valuable knowledge of growing in the province to benefit the entire industry. Future trials should continue to be conducted utilizing best management practices and acceptable farm practices.

The crop management decisions made and the farming methods utilized and at the Pasadena Research Project, including the decision to abandon the barley crop, are acceptable farm practices in the industry and therefore not liable in action as per Section 3(1) of the FPPA.

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## APPENDIX A: FIELD MAPS

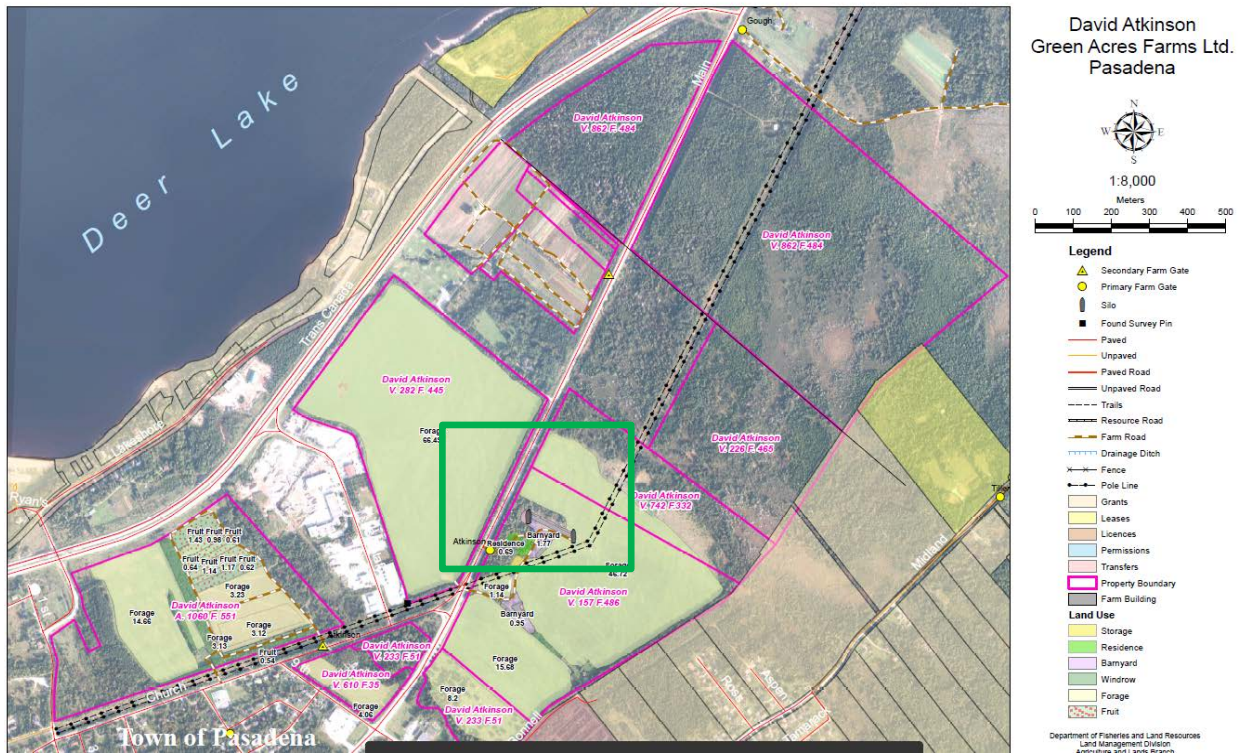


Figure 1: Green Acres Farms Ltd. farm field locations in Pasadena

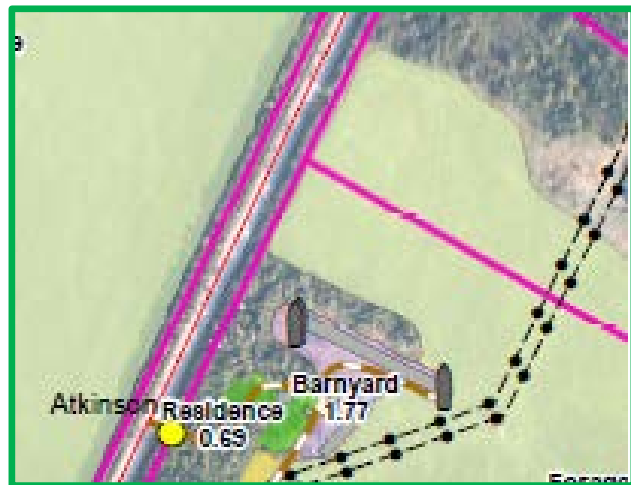


Figure 1a: FLR Research field location

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## APPENDIX B: FIELD PHOTOS

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*Figure 2: May 29, 2020 - Farm field*

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*Figure 3: May 29, 2020 – Farm field*

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*Figure 4: May 29, 2020 Farm Building*

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## APPENDIX C: WEATHER DATA

Date/Time	Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snow on Ground (cm)
2019-06-09	14.0	5.5	9.8	0.4		0.4	
2019-06-10	12.5	6.0	9.3				
2019-06-11	17.5	2.5	10.0	0.8		0.8	
2019-06-12	17.5	10.0	13.8	24.0		24.0	
2019-06-13	14.5	7.0	10.8	1.0		1.0	
2019-06-14	18.5	5.5	12.0	5.0		5.0	
2019-06-15	11.5	8.0	9.8	2.8		2.8	
2019-06-16	16.5	9.0	12.8				
2019-06-17	18.0	9.0	13.5	0.4		0.4	
2019-06-18	16.5	8.0	12.3				
2019-06-19	19.5	6.5	13.0				
2019-06-20	24.0	8.0	16.0	1.6		1.6	
2019-06-21	15.0	11.0	13.0	49.0		49.0	
2019-06-22	11.0	9.0	10.0	6.8		6.8	
2019-06-23	10.0	6.5	8.3	6.0		6.0	
2019-06-24	10.0	7.0	8.5	4.8		4.8	
2019-06-25	15.0	6.5	10.8	0.6		0.6	
2019-06-26	21.0	4.5	12.8				
2019-06-27	22.0	8.0	15.0				
2019-06-28	17.5	8.5	13.0				
2019-06-29	19.5	10.0	14.8	3.8		3.8	
2019-06-30	25.0	11.5	18.3	0.6		0.6	
2019-07-01	15.0	11.5	13.3	12.2		12.2	
2019-07-02	11.0	8.0	9.5	4.0		4.0	
2019-07-03	11.0	7.0	9.0	1.0		1.0	
2019-07-04	15.0	7.5	11.3	0.4		0.4	
2019-07-05	20.5	9.5	15.0	4.8		4.8	
2019-07-06	29.5	10.5	20.0				
2019-07-07	19.0	14.5	16.8				
2019-07-08	26.0	11.0	18.5				
2019-07-09	20.5	13.5	17.0	2.0		2.0	
2019-07-10	15.0	9.5	12.3	1.8		1.8	
2019-07-11	14.5	9.5	12.0				
2019-07-12	20.0	6.0	13.0				
2019-07-13	24.0	7.5	15.8				
2019-07-14	22.5	10.5	16.5	20.0		20.0	
2019-07-15	22.5	14.0	18.3	1.0		1.0	
2019-07-16	19.5	15.0	17.3				
2019-07-17	29.0	14.5	21.8	14.6		14.6	

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Date/Time	Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snow on Ground (cm)
2019-07-18	19.0	14.5	16.8				
2019-07-19	23.5	13.5	18.5				
2019-07-20	23.5	13.5	18.5				
2019-07-21	20.5	13.5	17.0	1.4		1.4	
2019-07-22	20.0	14.5	17.3				
2019-07-23	22.5	12.5	17.5	1.4		1.4	
2019-07-24	20.0	15.0	17.5				
2019-07-25	20.5	13.0	16.8				
2019-07-26	25.5	12.5	19.0				
2019-07-27	30.5	10.5	20.5				
2019-07-28	29.5	18.5	24.0				
2019-07-29	26.5	13.5	20.0				
2019-07-30	27.5	18.5	23.0				
2019-07-31	33.5	14.0	23.8	9.8		9.8	
2019-08-01	27.5	14.5	21.0	10.4		10.4	
2019-08-02	25.0	18.0	21.5				
2019-08-03	24.0	15.0	19.5				
2019-08-04	22.5	16.5	19.5	15.6		15.6	
2019-08-05	22.0	14.0	18.0	7.6		7.6	
2019-08-06	21.5	15.0	18.3				
2019-08-07	27.0	15.0	21.0				
2019-08-08	27.0	13.5	20.3				
2019-08-09	20.0	15.0	17.5	6.8		6.8	
2019-08-10	27.0	16.5	21.8				
2019-08-11	23.0	14.5	18.8	16.4		16.4	
2019-08-12	22.5	15.0	18.8				
2019-08-13	26.5	15.5	21.0	4.6		4.6	
2019-08-14	21.0	15.5	18.3				
2019-08-15	23.5	8.0	15.8				
2019-08-16	23.0	10.0	16.5	0.4		0.4	
2019-08-17	24.5	15.0	19.8				
2019-08-18	21.5	15.5	18.5				
2019-08-19	27.0	12.0	19.5				
2019-08-20	25.5	18.5	22.0				
2019-08-21	25.5	15.0	20.3	0.4		0.4	
2019-08-22	21.5	14.0	17.8	1.4		1.4	
2019-08-23	26.0	16.0	21.0	1.4		1.4	
2019-08-24	17.0	14.0	15.5	0.4		0.4	
2019-08-25	23.5	5.5	14.5				
2019-08-26	23.5	10.0	16.8				
2019-08-27	23.0	10.5	16.8	0.8		0.8	

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Date/Time	Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snow on Ground (cm)
2019-08-28	20.5	14.5	17.5				
2019-08-29	23.0	9.5	16.3				
2019-08-30	26.0	14.0	20.0	1.4		1.4	
2019-08-31	23.5	16.5	20.0				
2019-09-01	16.5	14.5	15.5				
2019-09-02	22.0	7.0	14.5	2.0		2.0	
2019-09-03	19.5	14.5	17.0	20.4		20.4	
2019-09-04	23.0	11.5	17.3	8.4		8.4	
2019-09-05	21.5	14.5	18.0	6.8		6.8	
2019-09-06	15.5	10.0	12.8				
2019-09-07	19.0	5.0	12.0	7.8		7.8	
2019-09-08	15.0	10.0	12.5	2.0		2.0	
2019-09-09	14.5	7.5	11.0				
2019-09-10	14.5	6.0	10.3				
2019-09-11	12.5	7.5	10.0	9.8		9.8	
2019-09-12	12.5	9.0	10.8	0.8		0.8	
2019-09-13	14.5	2.5	8.5	0.8		0.8	
2019-09-14	18.5	1.5	10.0	0.6		0.6	
2019-09-15	19.5	9.0	14.3	0.4		0.4	
2019-09-16	18.0	14.5	16.3	4.6		4.6	
2019-09-17	11.0	8.0	9.5	3.8		3.8	
2019-09-18	12.0	6.5	9.3				
2019-09-19	18.5	2.0	10.3				
2019-09-20	23.5	6.5	15.0	1.2		1.2	
2019-09-21	13.0	9.5	11.3				
2019-09-22	20.0	3.5	11.8	3.8		3.8	
2019-09-23	19.0	15.0	17.0	3.8		3.8	
2019-09-24	17.5	7.0	12.3	7.0		7.0	
2019-09-25	12.0	7.0	9.5	21.6		21.6	
2019-09-26	16.5	7.5	12.0	0.4		0.4	
2019-09-27	15.0	9.5	12.3	7.4		7.4	
2019-09-28	15.0	10.0	12.5	4.6		4.6	
2019-09-29	15.0	9.5	12.3	3.8		3.8	
2019-09-30	9.0	7.0	8.0	0.4		0.4	
2019-10-01	9.5	5.0	7.3	1.0		1.0	
2019-10-02	9.5	3.0	6.3	0.4		0.4	
2019-10-03	8.5	1.5	5.0	0.4		0.4	
2019-10-04	9.5	1.5	5.5	0.8		0.8	
2019-10-05	6.5	1.0	3.8				
2019-10-06	12.5	0.0	6.3				
2019-10-07	15.0	4.5	9.8	16.6		16.6	

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Date/Time	Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snow on Ground (cm)
2019-10-09	12.0	4.5	8.3				
2019-10-10	16.0	0.5	8.3				
2019-10-11	18.5	-1.5	8.5				
2019-10-12	18.5	0.0	9.3	13.6		13.6	
2019-10-13	14.0	10.0	12.0	4.4		4.4	
2019-10-14	12.5	4.5	8.5				
2019-10-15	11.0	2.0	6.5	1.6		1.6	
2019-10-16	13.0	5.5	9.3				
2019-10-17	11.0	0.0	5.5	1.4		1.4	
2019-10-18	18.0	8.0	13.0	2.2		2.2	
2019-10-19	10.5	7.5	9.0	1.4		1.4	
2019-10-20	8.0	5.0	6.5	1.8		1.8	
2019-10-21	9.5	5.0	7.3	0.4		0.4	
2019-10-22	12.0	3.5	7.8	2.0		2.0	
2019-10-23	12.0	3.5	7.8	2.0		2.0	
2019-10-24	13.5	7.0	10.3	2.6		2.6	
2019-10-25	10.0	3.0	6.5	1.0		1.0	
2019-10-26	8.0	3.0	5.5	1.0		1.0	
2019-10-27	4.5	1.5	3.0	0.4		0.4	
2019-10-28	9.0	-2.5	3.3				
2019-10-29	8.0	-1.0	3.5				
2019-10-30	10.5	0.0	5.3				
2019-10-31	14.5	6.0	10.3	37.2		37.2	
2019-11-01	22.0	6.0	14.0	7.2		7.2	
2019-11-02	7.5	4.0	5.8	2.2		2.2	
2019-11-03	5.0	0.5	2.8	16.8		16.8	
2019-11-04	9.0	1.0	5.0	1.2		1.2	
2019-11-05	10.5	0.5	5.5	6.6		6.6	
2019-11-06	10.5	6.0	8.3	20.6	1.0	21.6	
2019-11-07	2.5	0.0	1.3	2.0	10.2	12.2	1.0
2019-11-08	0.0	-3.5	-1.8		10.2	10.2	10.0
2019-11-09	-1.0	-3.5	-2.3		4.2	4.2	14.0
2019-11-10	5.5	-3.0	1.3	0.6		0.6	12.0
2019-11-11	5.5	-0.5	2.5	1.4	1.6	3.0	5.0
2019-11-12	14.5	-5.5	4.5	44.0	7.2	51.2	5.0
2019-11-13	7.5	0.5	4.0	6.0	2.4	8.4	
2019-11-14	1.0	-3.5	-1.3				
2019-11-15	8.0	-4.0	2.0	7.2	1.6	8.8	
2019-11-16	0.0	-3.5	-1.8		3.0	3.0	2.0
2019-11-17	1.5	-4.5	-1.5				
2019-11-18	4.5	-5.5	-0.5	17.8	1.4	19.2	2.0

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Date/Time	Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snow on Ground (cm)
2019-11-19	2.0	-1.0	0.5	5.2		5.2	
2019-11-20	4.5	0.0	2.3	1.6		1.6	
2019-11-21	3.5	1.5	2.5	0.6		0.6	
				<b>605.0</b>	<b>42.8</b>	<b>647.8</b>	

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## APPENDIX D: PHOTOS OF HARVESTING CONDITIONS

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*Figure 5: November 4, 2019 – Field and crop conditions*



*Figure 5a: November 4, 2019 – Enlargement detailing immature growth*

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*Figure 5: November 14, 2019 - Unloading harvest combine to field for harvest attempt #1*

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Figure 6: November 21, 2019 - Harvest attempt #2

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