1. Scope

This document is designed to assist departmental leaders (e.g. Chairs, Directors) and principal investigators /supervisors to identify lead trainers for each research team or as related to specific equipment and to then provide guidance and support to those appointed trainers by outlining the key components of training.

Appointed Trainers

Considerations for appointing a trainer should include:

- **Hands-on- Experience:** ideally, at least two years of direct experience operating the equipment when possible.
- **Hazard Awareness:** a strong understanding/comprehension of the potential hazards in operating the equipment.
- **Operational Competence:** proficiency in operating the equipment through a review of use of the equipment, knowledge of location specific practices, safety features and any equipment updates.

Trainers' ongoing knowledge will be supported through equipment-specific training sessions, meetings or interaction with farm and field equipment manufacturers, their distributors or suppliers, as available (e.g., Case or John Deere tractors, Almaco, Hege or Zurn plot combines, etc.)

The appointed trainer will:

- Access and review the manufacturer's equipment manuals in detail.
- Conduct/ lead a review of associated hazards using a hazard and control assessment too.
- Be involved in the development and/ or review of the equipment standard or safe operating procedure (SOP) annually.

Be the lead for training new staff on the equipment, annually or as needed.

2. Equipment Manuals

Manufacturers manuals will be sourced and housed electronically on a shared drive such that trainers, operators, and the mechanic will have access.

3. Equipment Reviews and Hazard Assessment

Equipment will be reviewed, and a hazard assessment documents, using the hazard assessment template developed by EHS. Incorporate the hazard assessment findings into the SOP and training. See Appendix A – Hazard Assessment Tool.

An equipment review and hazard assessment template, developed in collaboration with EHS, will be used by technical teams to evaluate field equipment and related tasks, such as calibration or adjustments for trailering. The results will be incorporated into the SOP for training.

If the equipment is modified, the hazard assessment must be revisited capture the modifications, and any amendments incorporated into the SOP to reflect any new or removed hazards. **See Appendix A – Hazard Assessment Tool**.

4. Standard or Safe Operating Procedures

Each piece of field equipment must have a standard or safe operating procedure (SOP) that aligns with the manufacturer's operating manual and accounts for the hazards identified and documented during the equipment review and hazard assessment.

The SOP must cover at a minimum the following topics:

- personal protective equipment
- pre-use equipment inspections
- step-by-step operating instructions
- training requirements
- storage and transportation
- maintenance requirements

5. Training Prerequisites

All research team members will complete the required generic onboarding training prior to training on specific farm equipment. This generic training includes but is not limited to:

- EHS Worker Health and Safety Awareness Training or EHS Supervisor Health and Safety and Due Diligence course
- EHS Field Worker Safety
- EHS Tractor Safety Basics

Registration for the above courses is through the EHS Registration System.

6. Training Delivery

Equipment-specific training on field equipment use must be provided and documented prior to seasonal use and at least annually. The generic and mandatory EHS training outlined above must be completed by all participants and verified prior to their attending farm equipment training.

Training delivered to equipment users will be comprised a review of:

1. A review of PPE necessary for use with the equipment
2. A review of the equipment manufacturer's manual and/or the departmental SOP
3. Verbal instruction going over the operational components
4. General safety reminders
5. A review of hazards and associated controls, such as guards
6. A pre-start circle check and a list of items to check,
7. A hands-on demonstration of the equipment including start up, travel and operational modes and shut down,
8. A practice session by the participants
9. Review of troubleshooting of specific equipment issues and how to engage the maintenance team,
10. Conducting and documenting a practical skills assessment for each participant.
11. Discussion on the need for transportation of the equipment and any related preparation as part of the training, including whether transportation is carried out/ permitted by research teams or through retention of professional trucking services. Note: transportation by research teams requires CVOR licensing, suitable truck and trailer, training in loading and unloading, trailering and load security including tie down practices.
12. Training to include a review of troubleshooting specific equipment issues, discussion on how and when to engage the maintenance team and the annual maintenance schedule as identified in the equipment SOP.

Following training, the trained participant/ operator or assistant will be fully acquainted with:

1. the controls,
2. be familiar with the safe operation of the equipment and
3. able to demonstrate competency through completion of the associated equipment's practical skills assessment, in line with their role and actions.

Training records must be submitted to and retained by the department. See Appendix B - Sample Training Attendance/SOP Review.

7. Comprehension and Practical Skills Assessment

All components of the equipment must be reviewed with the participants. Components must be explained such as use of the clutch, adjusting of attachments, locking of dual brake pedals as appropriate, etc. The training session will include different means of training (e.g., review of related documents, hands-on demonstration, verbal instruction and discussion, participant activity, etc.). and be documented.

Trainers will employ a checklist to assess participants on the practical skills necessary for the equipment and includes but is not limited to:

- required/use of personal protective equipment,
- completion of a pre-operational inspection,
- seating and visual/ mirror adjustments,
- equipment start-up,
- smooth use of controls,
- driving forward,
- reversing,
- parking and
- related aspects of the specific equipment use, i.e., attachments, raising, lowering and positioning.

see Appendix C – Sample Practical Skills Assessment, template can be adjusted for specific field equipment.

Complete the Training Record Field Equipment document for each trainee. See Appendix D.

8. Documentation and Retention

Training documentation will record components of the training session completed, including content, name of trainer, date and location, the participants and their practical skills assessments. The Training Record will list all equipment each trainee is authorized to operate.

Training documents will be retained by the department.

Appendix A: Hazard Assessment Tool:

1. EQUIPMENT DETAILS		
Campus / station:	**Department:**	
Equipment Name:	**Initial Assessment Date:**	**Review Date:**
Description of equipment and use:		
Location:	**Building:**	**Room Number:**
Person in charge of the equipment: **Reviewed with:**		
Manufacturer/Make/Model:	**Purchase Date:** ***(estimate if unknown)***	
Serial No. and/or Asset No.		
Installing Company (if applicable):		
Service/Calibration Contractor (if applicable): **Manufacturer Manual Available: ☐Yes ☐ No**		
Any relevant regulation, code, standard, guideline or U of G Policy (list):		
Licensing, Permitting or Certification: **Are there any licensing/permitting/certification requirements associated with ownership or operation of the equipment? ☐ Yes ☐ No** **Are licenses or permits obtained and displayed? ☐ Yes ☐ No** **Permit #:** **License/Permit/Certification Type:**		

3. HAZARD IDENTIFICATION AND CONTROL			
Identify hazards (use the checklist on page 2) and then detail the control measures required.			
Controls to be considered in the following order: **1. Elimination (is it necessary?)** **2. Substitution (consider potential new hazards)** **3. Isolation (restrict access)** **4. Engineering (guarding, redesign)** **5. Administration training, SOP)** **6. Personal Protective Equipment (PPE) (e.g. gloves, leather apron, coveralls, hearing, respirator etc.)**			
Identified Hazards	**Required Controls**	**Controls Implemented**	
		Yes ☐	**No ☐**
		Yes ☐	**No ☐**
		Yes ☐	**No ☐**
		Yes ☐	**No ☐**
		Yes ☐	**No ☐**

4. Implementation Plan (for controls not already in place)			
Control Selected	**Person(s) responsible**	**Proposed completion**	**Actual completion**

4. HAZARD IDENTIFICATION					
	Check the hazards that apply for all equipment-related tasks				
	Mechanical hazards		**Radiation**		**Movement and controls**
	Accumulation of energy e.g. springs, liquids or gases under pressure, vacuum		Low-frequency, radio frequency radiation; microwaves		**Unexpected movement when starting engine**
	Crushing hazard		Infrared, visible and UV radiation		**Inadequate design or identification of manual controls or visual display**
	Cutting, shearing, friction or abrasion hazard		X-rays and gamma rays		**Lack of braking - insufficient ability to slow down, stop and immobilize**
	Entanglement, drawing in or trapping hazards		Lasers		
	Impact hazard		Alpha and beta rays, electron beams neutrons		**Loads/ Load Security**
	Puncture/injection hazard		**Ergonomics/Human Factors**		**Load able to fall on operator**
	High pressure		Unhealthy postures or excessive effort		**Load causing machine tipping, affecting turning (lack of stability)**
	Electrical hazards		Inadequate consideration of hand-arm or foot-leg anatomy / positioning		**Unusual hazards from coupling and towing**
	Contact with live parts (direct contact)		Extended reach or clearance		**Tight turning = potential jack knife**
	Contact with parts which have become live under faulty conditions (indirect contact)		Requires forceful repetitive action		**Roll Over Potential (ROPS)**
	Access to live parts under high voltage (arc flash)		Awkward positioning required to allow sight line during tasks		**Seat betls missing – ROPs in place**
	Materials and substances		Inadequate lighting		**Seat belts – no ROPS**
	Contact/inhalation of harmful fluids, gases, mists, fumes, dusts		**Thermal hazards**		**Slips, Trips and Falls**
	Fire and explosion		Burns, scalds by contact with objects or materials (hot or cold)		**Leaning off equipment required**
	Biological, chemical or microbiological hazards		Hot or cold exposures /environment		**Slippery surfaces**
	Oxygen deficiency		**Noise**		**Fall while mounting or dismounting – lack of hand /foot holds**
	Vibration		Hazardous noise levels		**Uneven surfaces or stair treads**

	Hand-arm vibration		Interference with team communication		**Fall <3m**
	Whole body vibration		**Other**		**Fall >3m**

Completed by:		
Name:	Signature:	Date:
Position Title:		

Reviewed by: (e.g., Principal Investigator, Supervisor, Manager)		
Name:	Signature:	Date:
Position Title:		

Appendix B: Sample Training Attendance/SOP Review

Date: _____

Training delivered by: _____
Training pertains to: _____

Components of Training (please check):

- ❑ Review of the manufacturer's manual
- ❑ Review of the SOP
- ❑ Verbal instructions
- ❑ Demonstration

Operational Reminders:

•
•
•
•

Safety Reminders:

•
•
•
•

Attendee Name (please print)	Signature

Appendix C: Sample Equipment Operator Practical Skills Assessment:

Operator Name:_____ Evaluation Date:_____

Department: _____ Location: _____

Unit:_____ Examiner: _____

Skills observed: (use NA if necessary)

	Done	Discussed	Stopped-Corrected
PPE worn, as required: footwear, eye protection,			
Hearing protection, glove?			
Pre-op circle check done			
all fluids checked, as appropriate			
Belts, chains, machine greased, guards closed/secured			
Review – cutting bar, pick up reed, sickle bar			
3-point contact to mount unit			
Seatbelt used			
Ladder pulled up and secured			
Start-up: equipment controls checked: clutch, lights			
Check thresher working			
Equipment controls checked: clutch, lights			
Traveling: safe speed for the conditions			
attention paid to obstacles: other equipment,			
guardrails, fenceposts, doorframes etc.			
Load handling:			
Reversing, looks before backing up			
reverses smoothly			
Reduce speed on uneven surfaces			
Avoid driving across steep slopes			
Road Travel:			
Lock brake pedals together for road travel, if applicable			
Drive on main part of road, not shoulder			
engine shut down and cool			

Spills prevented, or cleaned up and reported			
Changing / adding attachments			
storage of attachments			
Preparation for transport			
Shutdown: parking brake on, key removed			

Appendix D: Training Record Field Equipment

General: Handout (pages 1-2) provided to: _____

1. Protective safety footwear must be worn on campus, research station and off-station field locations.
2. Seat belts must be worn in vehicles and on equipment if provided and a rollover protection system (ROPS) is in place. If ROPS is adjustable, ensure it is in the upright position whenever possible.
3. Drivers are expected to follow all traffic laws. Drivers are not permitted to use cellular devices to talk or text while operating University of Guelph vehicles. Pull over and park.
4. No smoking on UofG facilities or off-station locations or in University field equipment or vehicles.
5. If in doubt about procedures or equipment use, ask for guidance.

Equipment:

1. Equipment must be operated only by authorized and trained operators or during training, delivered by a designated trainer for the specific equipment. This includes field, shop and lab equipment.
2. Equipment safety shields and guards must not be removed.
3. Hydraulic equipment must be lowered to the ground and/or safety supports in place before parking or working underneath.
4. Do not attempt to fix equipment while working alone. Call for help.
5. Operate ride-on equipment when seated on the permanently mounted seats with feet on footrest/floor.
6. Report broken or damaged equipment to your supervisor and/or research station staff who can undertake and/or arrange for repairs.
7. Tractors and implements should be cleaned before being parked at the end of the day.
8. Follow the station or campus rules about crossing roadways; some equipment requires a guide vehicle.

STANDARD OPERATING PROCEDURE FOR EQUIPMENT OPERATION

Pre-Operation:

1. Have you been trained and authorized to operate this tractor?
2. Check for loose or broken parts, screws or hoses.
3. Check for other objects left on the equipment, e.g. tools, ropes, trash, phones, research supplies, etc.
4. Check all fluid levels and for flat or low tires.
5. Check for leaks, cracks in frame or rollover protection structure (ROPS) and seatbelt for damage.
6. Check the lights, including operation of hazard lights.

7. Check the glass and mirrors for cracks or chips impeded vision.
8. Check attachments are secure and in good condition. A secondary means of attachment is required for travel on roadways.
9. Ensure there is a slow-moving vehicle (SMV) sign mounted properly on the rear most part of the tractor or towed equipment.
10. Is there a first aid kit and fire extinguisher in the tractor or truck for distance road travel?
11. Check fuel levels. Should it be gas or diesel?

Operation:

1. Check for objects (including those overhead) or bystanders, before and continuously throughout operation. Look in the direction you are travelling.
2. Check that gauges and attachments work properly.
3. Wear the seatbelt, when ROPS is present and upright.
4. Ensure that differential brakes are locked together for road travel.
5. Drive according to conditions; consider uneven ground and avoid steep slopes.

Training Plan- Materials:

- Manufacturer's operator's manual (instructional videos)
- Departmental SOP and attendance sign-off sheet
- Hazard Assessment Tool

Training Steps – follow the EHS Farm Equipment Training Guidance

1. Review the manufacturer's manual and/or the departmental SOP (watch videos if available).
2. Review the necessary PPE.
3. Have a trainer explain the equipment controls.
4. Discuss general safety reminders.
5. Review the hazards and associated controls, such as guards.
6. Complete a pre-start circle check.
7. Trainer: provide a hands-on demonstration, including start up, travel and operational modes and shut down.
8. Allow a practice session by the participants in an open area.
9. Review troubleshooting of specific equipment issues and how to engage the maintenance team.
10. Carry out and document a practical skills assessment for each participant.
11. Discuss the need for transportation of the equipment and any related preparation, as part of the training, including whether transportation is carried out/ permitted by research teams or through retention of professional trucking services. Note: transportation by research teams requires CVOR licensing, suitable truck and trailer,

training in loading and unloading, trailering and load security including tie down practices.

12. Provide feedback and request questions or feedback on each step.

Following training, the trained participant/ operator will be fully acquainted with:

1. the controls,
2. be familiar with the safe operation of the equipment and
3. able to demonstrate competency through completion of the associated equipment's practical skills assessment.

Training records must be submitted to and retained by the department.
Provide Page 1 & 2 to Trainee, make checklist available to the Trainee when complete.

Staff operating or assisting with any class of equipment must receive training by their supervisor or by designated experienced staff. The hiring supervisor is responsible to ensure that competency is achieved.

Operator Name (print): _____ Date: _____
Department: _____ Station/Location: _____
Supervisor: _____ Trainer: _____

Equipment Class	Description and use – on road?	Review SOP	Review Manual	Practical: Demo, Assess	Date	Print name	
						Operator	Trainer/ Supervisor
Tractor: < 40hp							
➢ 40 hp							
Tractor plus: (towed implement)	Batwing/Bushhog						
	+ sprayer						
	water tank, water wagon, grain wagon						
	+ mower						
	+ tiller						
	+ auger						
Tractor & Planter:							
Combine:							

Self-Propelled	Ride mower						
Landscape	Push Mower						
	Weed trimmer						
Utility vehicles	Gator/Scout/Kubota						
Shop Tools	Pressurized Air Line						
	Pressure Washer						
	Drill Press						
Other	Drying Room						
	Batch Dryers						

I have reviewed and understand the safe use of the equipment using the Manufacturer's manual or SOP. **I have demonstrated competence in operation for my trainer or supervisor – as indicated above.**

Operator Signature: _____ Date: _____

Authorized Trainer Name (please print): _____ Sign: _____

FARM EQUIPMENT /TRACTOR SAFETY REVIEW: OPERATORS	Initials	Date
Check that the operating manual is available – on the unit or in the shop.		
Only operate farm equipment that you have been trained on.		

Walk around the equipment before start-up: make a visual check for bystanders and other hidden objects (in grass, doorway obstructions, etc.)		
Complete a pre-operational check: assess check lights, shields and guards, tires, brakes? Check all fluid gauges (oil, hydraulic, gas, etc.)?		
Prior to towing equipment, check the safety hitch pins & secondary chains.		
Check the slow-moving vehicle (SMV) sign is clean, and with good reflective qualities, mounted correctly, and on the rear-most part of the equipment.		
Take supplies to the field, e.g., a hat & source of drinking water on hot days.		
Check for the first-aid kit available - on the tractor or in truck. Check for the fire extinguisher – prior to road trips.		
Prior to starting vehicle in buildings, open doors & windows, start ventilation fans.		
Check unit steps free of mud, or debris; check handholds to allow 3-point contact when mounting equipment.		
Check the seatbelt in combination with the rollover protective structure (ROPS). Always wear seatbelts when ROPS in the upright position, as applicable.		
Adjust the seat or choose a tractor / unit compatible to your stature.		
All operators/ assistants must remain seating on a permanently mounted seat.		
For loads in front-end loaders or on forks, travel with the load low to avoid tipping and allow unimpeded sight lines.		
Steer clear of hazards such as ditches, steep hills and other tipping hazards.		
Lock the brake pedals together before roadway travel. Follow posted signs and signal all turns.		
Travel at a suitable speed for traffic and road conditions.		
Check clearance from overhead power lines, when appropriate.		
Lower mounted attachments before you shut down the equipment.		
Remove equipment keys when not in use, to prevent unauthorized use.		
