

# Working on Gradients Policy

## Purpose

This policy provides guidance of a safe way of working on gradients. T

## General Safety

Prior to carrying out any work on slopes the following must be assessed as safe:

- The weather and terrain conditions of the slope.
- The operator is trained and competent to work on slopes and on the terrain.
- Use the right vehicle for the terrain and task
- The vehicle is safe to operate on slopes
  - o Appropriate pre-inspection completed.
  - o Safety features installed (ROPS, seatbelt etc.)
  - o Vehicle is fitted with appropriate tyres (Grippy, min 50% tread) recommended by the vehicles retail provider, including recommend tyre pressure and ballast (weights or water in tyres?).
- Towing and load is secure

When driving on a formed track, stay as close to the hillside as possible. Access track conditions (gradient, surface condition etc) and select safer alternative route if needed. Good track maintenance required.

### Worksafe Table:

Choosing the right vehicle for the job

VEHICLE USE	TWO-WHEELED FARM BIKE	GUAD	SIDE-BY-SIDE VEHICLE	UTE OR FOUR WHEEL DRIVE	SMALL TRUCK	SMALL FARM TRACTOR
<b>Working on farm</b>						
Inspecting farm and stock	✓	✓	✓	✓ <sup>4</sup>	•	•
Mustering of stock	✓	✓	✓	✓ <sup>4</sup>	•	•
Spraying	x	• <sup>1</sup>	✓	✓	✓	✓
Maintenance work	✓	✓	✓	✓	✓	✓
<b>Carriage of goods</b>						
Light tools, equipment and dogs	•	• <sup>2</sup>	✓	✓	✓	✓
Bulky loads and stock	x	x	•	✓	✓	•
Light, low or secured loads	x	✓	✓	✓	✓	✓
Heavy or high loads	x	x	•	•	✓	✓
Passengers	•	x	✓	✓	✓	x
<b>Ground conditions</b>						
Sealed roads	✓	x	x	✓	✓	•
Steep uneven terrain	✓	• <sup>4</sup>	• <sup>4</sup>	• <sup>4</sup>	x	x
Flat or gentle sloping terrain	✓	✓	✓	✓	✓	✓
<b>Rider capability</b>						
Inexperienced/untrained on farm	x	x	x	x	x	x
<b>Towing</b>						
Narrow or small trailer	x	• <sup>3</sup>	✓	✓	✓	✓
Other trailer	x	x	• <sup>3</sup>	✓	✓	✓

✓ Vehicle is appropriate for this task/circumstances if used safely  
 • Vehicle could be used but an alternative vehicle may perform better or be safer  
 x Caution: Vehicle may not be the safest vehicle for the task or in these circumstances

**\*\*Golden rule – Don't carry out the task if it is not safe to do so. \*\***

## Operating Tractors on slopes

If you use tractors or equipment on slopes, carefully assess the risks of overturning:

- Assess the slope and ground conditions before commencing work, always have plan B route (safe run out) before taking on that route, in case traction has been lost. If in doubt DO NOT commence the task.
- Make sure you are familiar with the slope. Walk the slope before driving it, check for underground springs, holes & bumps, pasture cover to active optimum traction or potential loss of traction.
- Tractor to be in 4WD
- Select the right gear before approaching the slope to avoid gear change on the slope.
- Down Hill-Select range that is fast enough to chase slide, then select lowest gear in that range eg John Deere C1 this allows safe gear change without using clutch by using Techtronic to shift up gears C2-C3-C4, if engine braking causes the tractor to slide, never use clutch to shift into D range when carry out control slide. Apply brakes (lightly/Feather) while starting your decent if tractor starts to slide release pressure on brakes and shift up gears as instructed above.
- Up Hill – Select range low enough to complete climb, preferably select mid gear eg. John Deere C3 this allows you to change down gears if tractor starts to loss power, engage diff lock at base of the climb also.
- If possible, remove front attachments from front end loader, place loader low to keep centre of mass low.
- Avoid quick sharp turns

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### 0-10 Percent

- No restriction of vehicle use on farm. Follow standard operating procedures.
- All vehicles and attachments can be used by trained operators.
- Drive to the terrain and weather conditions.

### 10-20 Percent

- **Two wheelers use permitted.** Take extra care after rain or around freshly irrigated k-line area. When descending always choose a route with a runout area.
- **Side by side use permitted.** Take extra care after rain or around k-lines. 4Wd must be engaged. When descending always choose a route with a runout area. Do not load the vehicle altering the centre of gravity (Secure heavy loads to prevent sliding around the back deck, changing the centre of gravity).
- **Tractor use permitted.** If ground conditions are wet, be extra careful and reduce speed.

### 20-30 Percent

- Operator must be assessed as competent in operating the vehicle and driving on slopes prior to carrying out the task.
- Make sure you are familiar with the slope. Walk the slope before driving it, check for underground springs, holes & bumps, pasture cover to active optimum traction or potential loss of traction.
- **Two wheelers use permitted.** Take extra care after rain or around freshly irrigated k-line areas. When descending always choose a route with a runout area.
- **Side by side use permitted.** Take extra care after rain or around freshly irrigated k-line areas. 4WD must be engaged. When descending always choose a route with a runout area. Do not load the vehicle altering the centre of mass. Low range must be used ascending and descending these slopes, side on traversing must be carried out at slow speed (less than 10km/hr)
- No **tractor** use in wet conditions.
- No towing with tractor due to risk of jack knifing and causing a roll over.
- **Tractor** use in dry conditions permitted - Take extra care when ground is hard and has lush pasture cover (traction is compromised grass is 90% water) or around k-lines. 4WD must be engaged. When descending always choose a route with a runout area. Remove front implement from front end loader & lower loader & rear implement as these alters the centre of mass. Select appropriate range gear and follow procedure mentioned above, try to select route so that you do not have to drive side on traversing if this action is required you must travel at slow speed (less than 10km/hr)
- Consider the hierarchy of controls, what could be done to eliminate or minimise vehicle usage in this area.

### 30-40 Percent

- Tractor use NOT permitted
- **Two Wheeler and Side by Sides use only.** Side by sides must not to be used across the hill face, only up and down. Take extra care after rain or around k-lines. 4WD must be engaged. Do not load the vehicle altering the centre of mass when descending, always choose a route with a runout area.
- Side by side: Reduce speed and select low range
- Consider the hierarchy of controls, what could be done to eliminate or minimise vehicle usage in this area.

### 40 Percent

- No go zone for all vehicles

## Contractors

- Contractor operations to be carried out in line with this policy. If contractors are working on steep parts of the farm, then contractors need to have a slope management plan. This work is likely to be classed as a critical risk.
- Only aerial spreading on Tunnel Block. NO ground spreading to be done.
- Contractor Management process to be completed. A site induction and an 'Agreed Ways of Working' form to be completed prior to any work commencing.

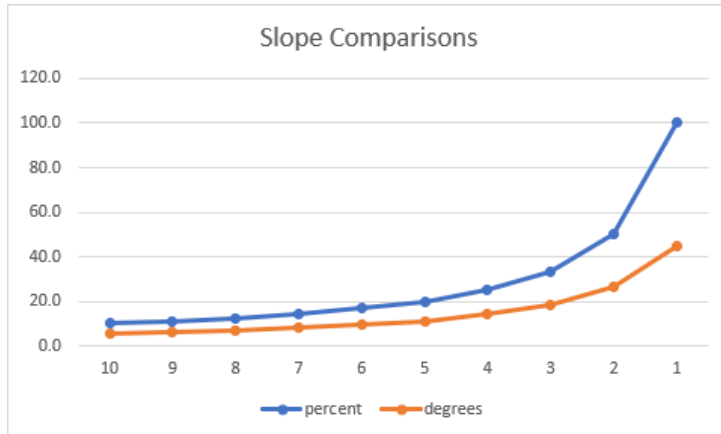
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## Useful Resources:

- WorkSafe Use the Right Farm Vehicle - <https://www.worksafe.govt.nz/topic-and-industry/agriculture/farm-vehicles/use-the-right-farm-vehicle/>
- Refer to the vehicle operator manual

## Percent V's degrees

Slopes are often referred to in degrees or percent. The graph below shows the conversion. .



Slope Comparisons	percent	degrees
1 in...		
10	10.0	5.71
9	11.1	6.34
8	12.5	7.13
7	14.3	8.13
6	16.7	9.46
5	20.0	11.13
4	25.0	14
3	33.3	18.4
2	50.0	26.6
1	100.0	45