

# Measuring splash erosion initiated by simulated rainfall



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## Procedure

- (i) To identify several positions under laboratory rainfall simulator with various rainfall intensity and kinetic energy
- (ii) To measure splash erosion initiated by 15 minutes rainfall on the pre-selected positions
- (iii) To evaluate the relationship between rainfall intensity, kinetic energy and soil loss

## Laboratory rainfall simulator



Laboratory rainfall simulator

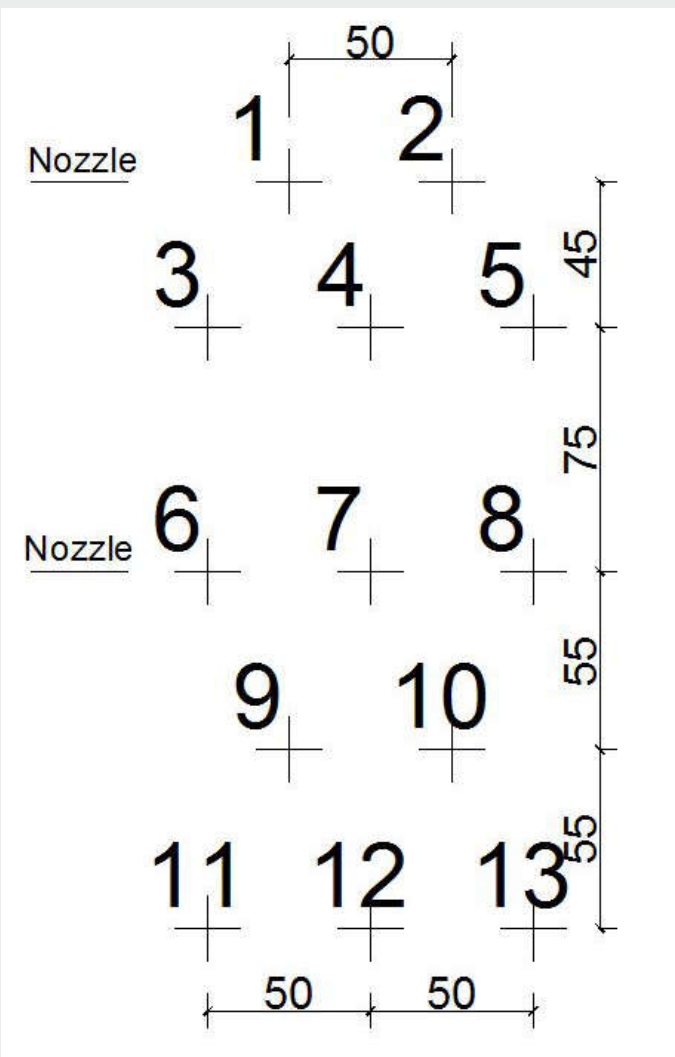


Veejet nozzle

Type: laboratory jet - Norton Ladder rainfall simulator  
Experimental area: 1,5 x 8 m  
Hydraulic parameters: 8 swinging nozzles (Veejet 80100)  
in two parallel sections, water pressure 41 KPa  
Height: 2,6 m  
Intensity: 20 - 80 mm/h  
Average drop size: 2,3 mm

## Positions under rainfall simulator

Position	Ekin (J m <sup>-2</sup> h <sup>-1</sup> )	Ekin (J m <sup>-2</sup> mm <sup>-1</sup> )	Intensity (mm h <sup>-1</sup> )
1	616	8	82
2	696	10	69
3	803	11	71
4	619	9	70
5	398	10	41
6	656	11	62
7	1174	14	85
8	584	8	74
9	538	14	38
10	630	13	47
11	207	10	22
12	396	13	31
13	254	13	19



Total 13 positions  
KE: 112 - 673 J m<sup>-2</sup> h<sup>-1</sup>  
Intensity: 19 - 71 mm h<sup>-1</sup>

## KE and intensity measurement

To measure the rainfall kinetic energy and intensity the Laser Precipitation monitor (LPM) by Thies Clima® was used.



LPM by Thies Clima



Monitoring of KE-I relationship

## Splash cups

Sample diameter: 10 cm  
Splash cup diameter: 50 cm  
Soil type: Loamy sand, organic carbon 1,7%,  
pH 6,9, fraction below 10 mm  
Loosely packed, mimicking seed bed conditions  
Soil surface 1cm below the edge of the sample holder



Illuminated splash cup



Soil sample detail

## Experimental setup

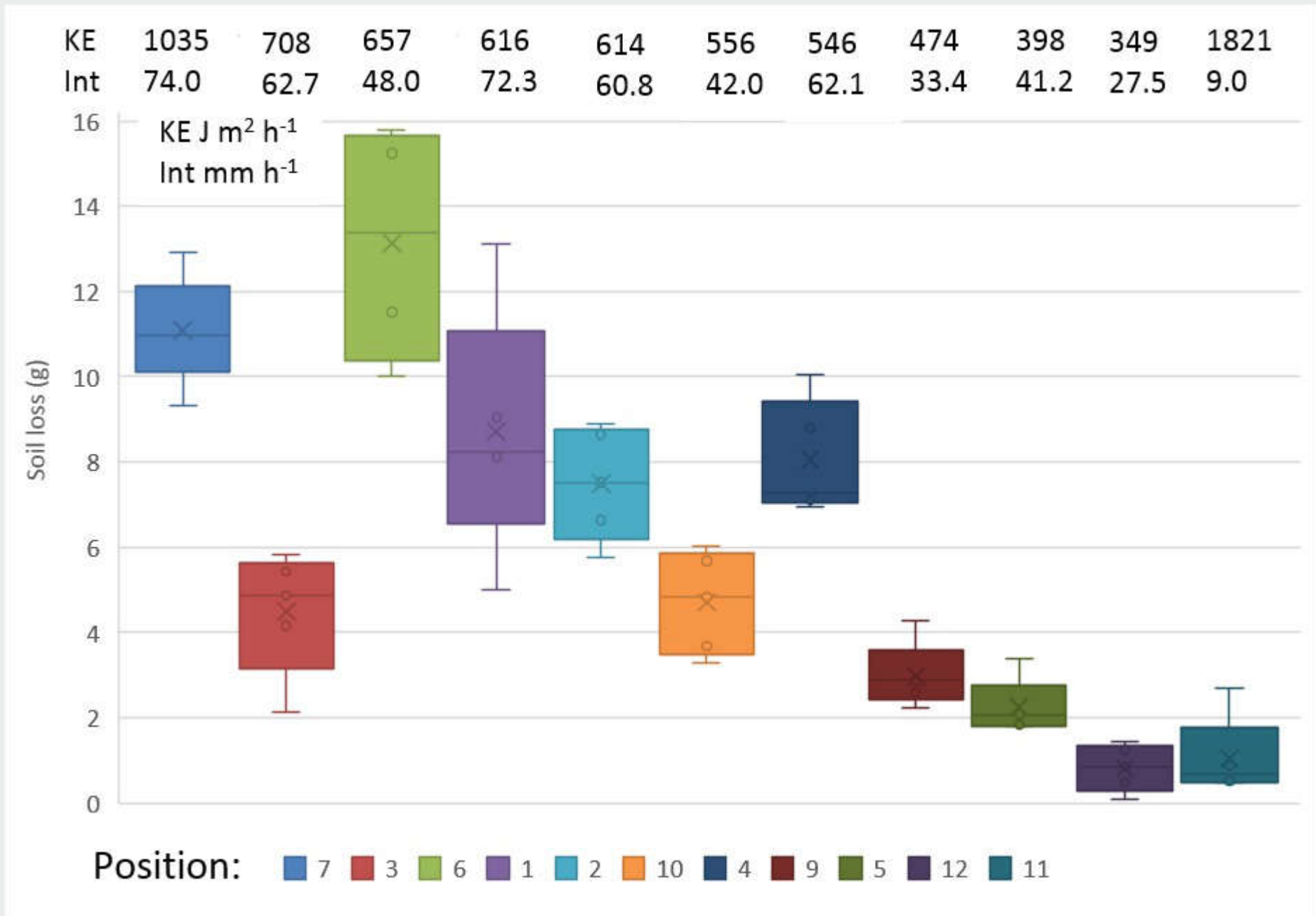


Splash cup experiment

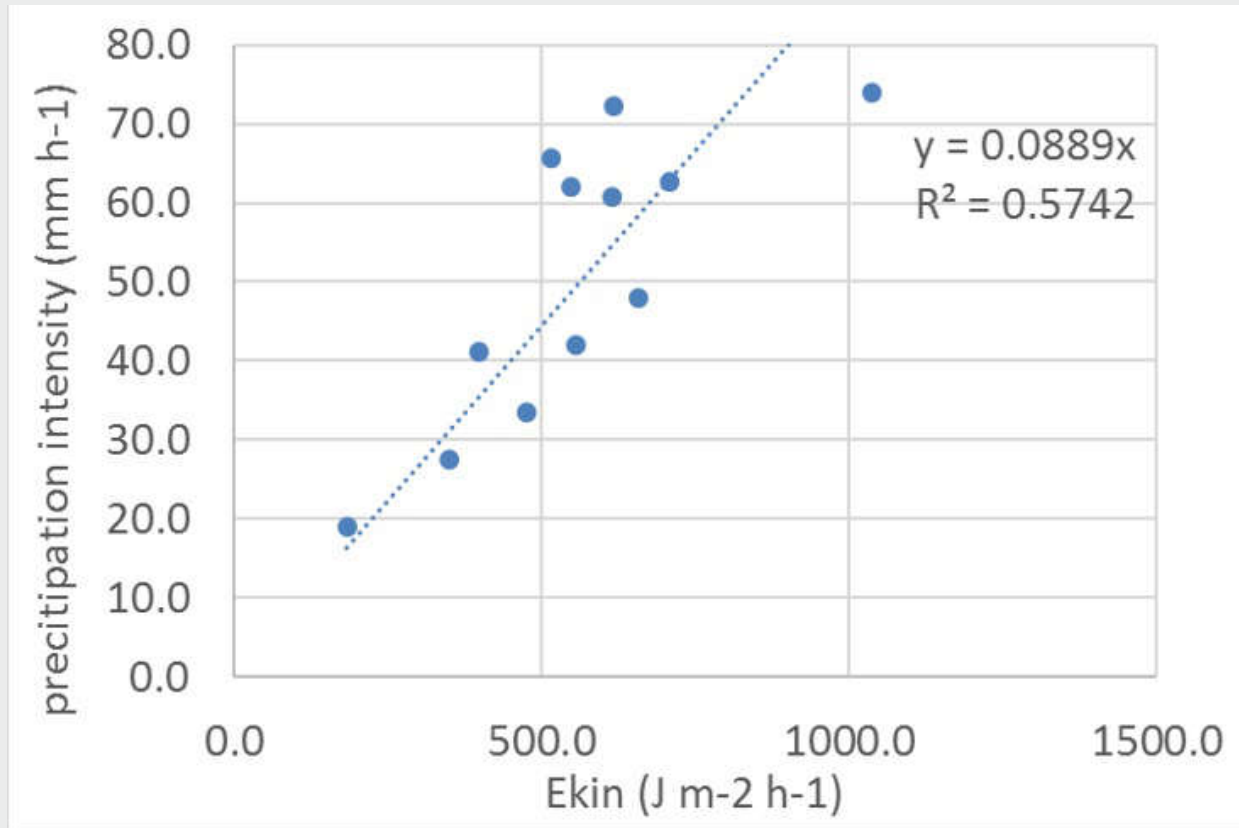
Splash cups:  
12 samples  
Duration:  
15 minutes rainfall  
Set intensity:  
60 mm/h  
Repetitions:  
5

On each splash cups  
the rainfall amount and  
detached soil particles  
mass were measured.

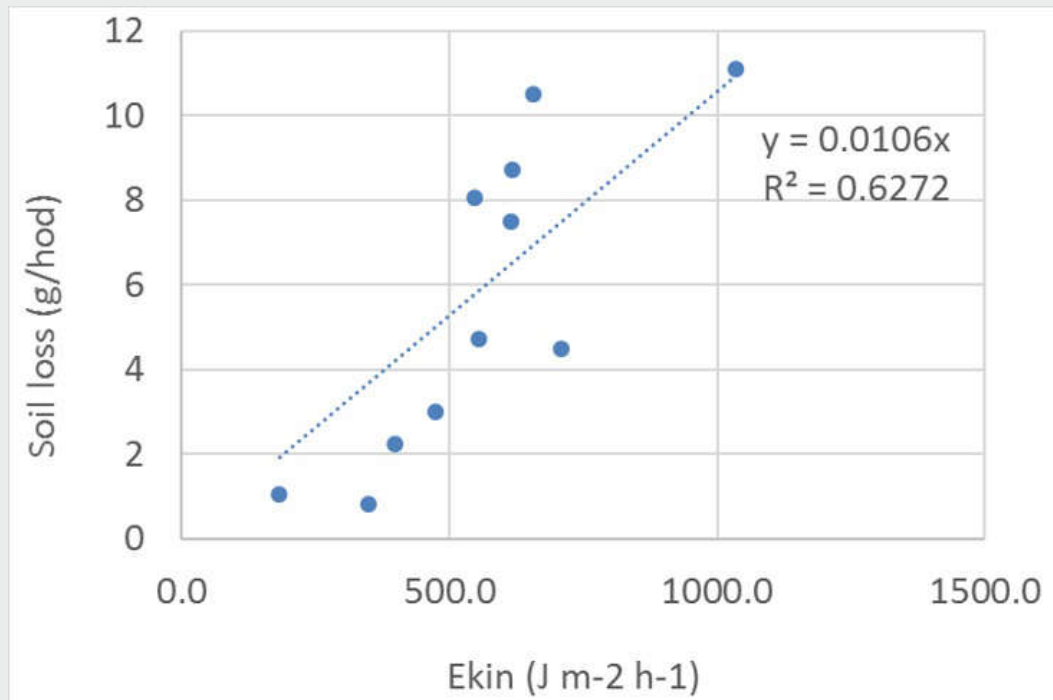
## Results



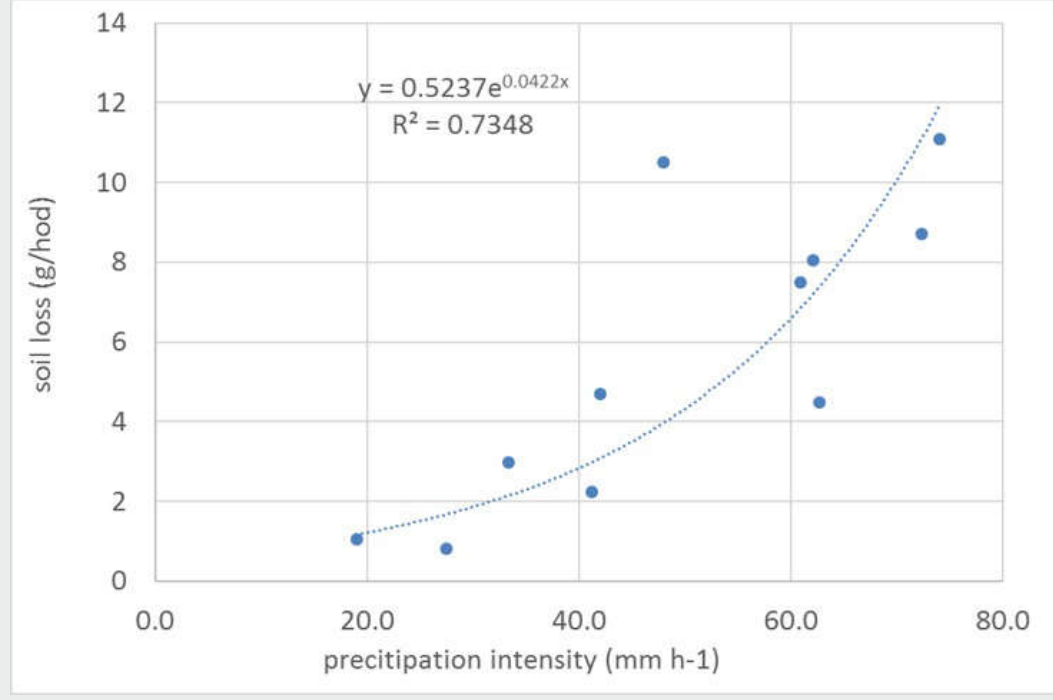
Soil loss due to splash erosion on the selected positions



KE - I relationship



KE - soil loss relationship



I - soil loss relationship