Reseeding *Anthephora pubescens* and *Brachiara nigropedata* as a restoration measure at the Waterberg, central Namibia; impacts of rainfall, soil properties and nutrients.

OPTIMASS

Federal Ministry of Education and Research

DLR Project Management Agency

Allan Kandjai, Dave Joubert, Niels Blaum

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Presentation outline

- Introduction
- Objectives
- Study area and methods
- Results and discussions
- Conclusions
- Acknowledgements

Introduction

- Free ranging animals, whether domestic livestock or wildlife depend greatly on rangelands for forage (Rothauge, 2007).
- A good rangeland is one dominated by climax perennial grass species that are highly palatable, nutritious and productive
- If grazed continuously results in their drastic decline (Rothauge, 2007).
- A majority of Namibia's rangelands are currently suffering this consequence, which has been intensified by recurrent droughts over the past years.
- About 70 % of the population is directly or indirectly dependent on the country's natural rangelands (National Rangeland Management Policy and Strategy (NRMPS)

Introduction

- Most rangelands in Namibia, like those of South Africa are degraded to such an extent that the application of management practices or even the complete removal of grazing will not result in the recovery of species composition, vegetation cover and density (Snyman, 2003)
- A more practical approach such as reseeding is carried out to improve
- Rangeland condition
- Increase grazing capacity
- Improve soils

OBJECTIVES

Overall aim of the study was to reseed A. pub and B. nig to the area where they once occurred

- To determine how nutrient addition influences germination and establishment of *A. pubescens* and *B. nigropedata*
- Does soil properties influence the germination and establishment of *A. pubescens* and *B. nigropedata* and production of grasses and forbs
- Is there a transitional shift in vegetation over the two years

Study area

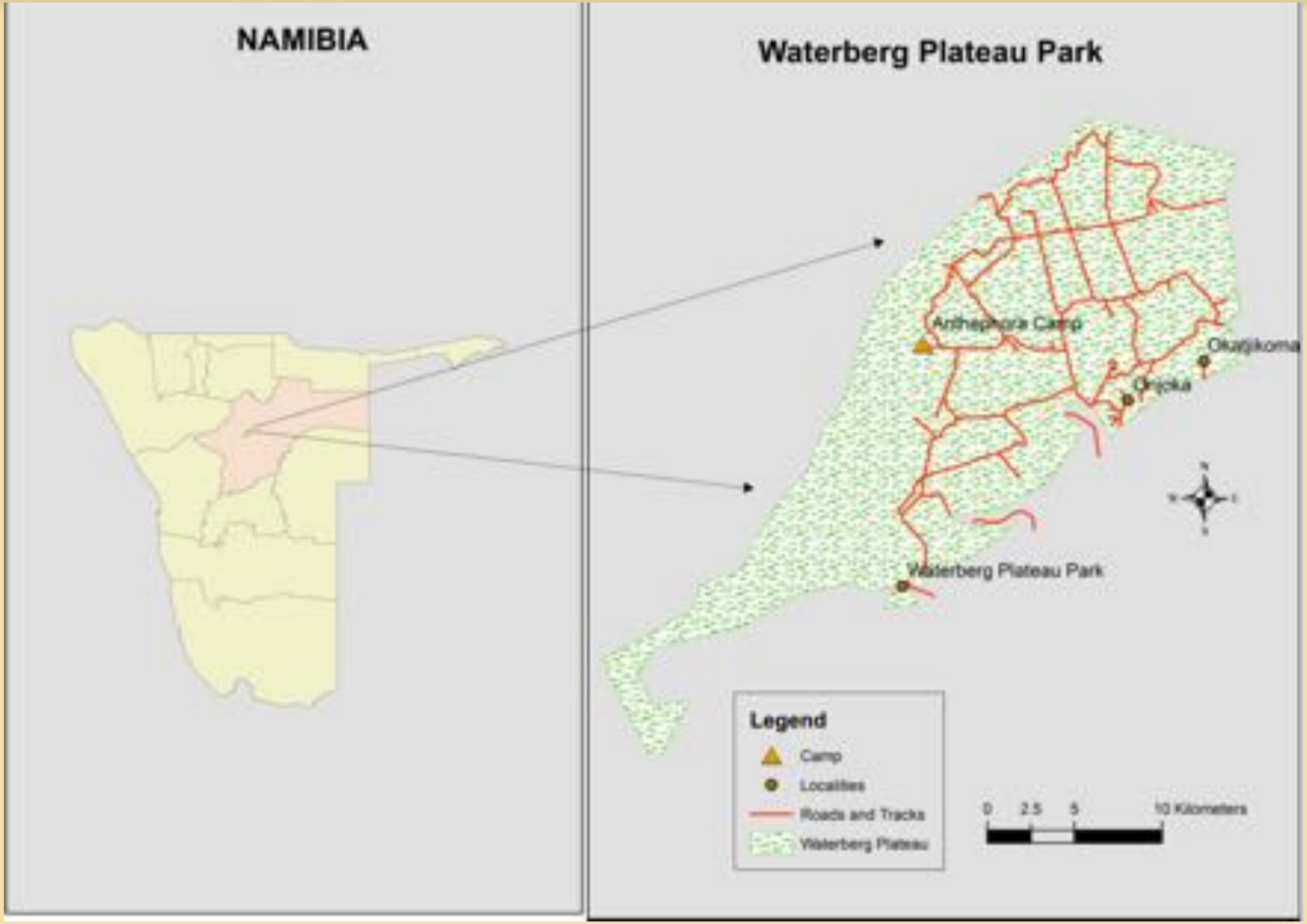

Figure 1. Namibian map indicating Waterberg Plateau Park

Methods

Methods

Results and discussions

Rainfall data of the Waterberg

Results and discussions

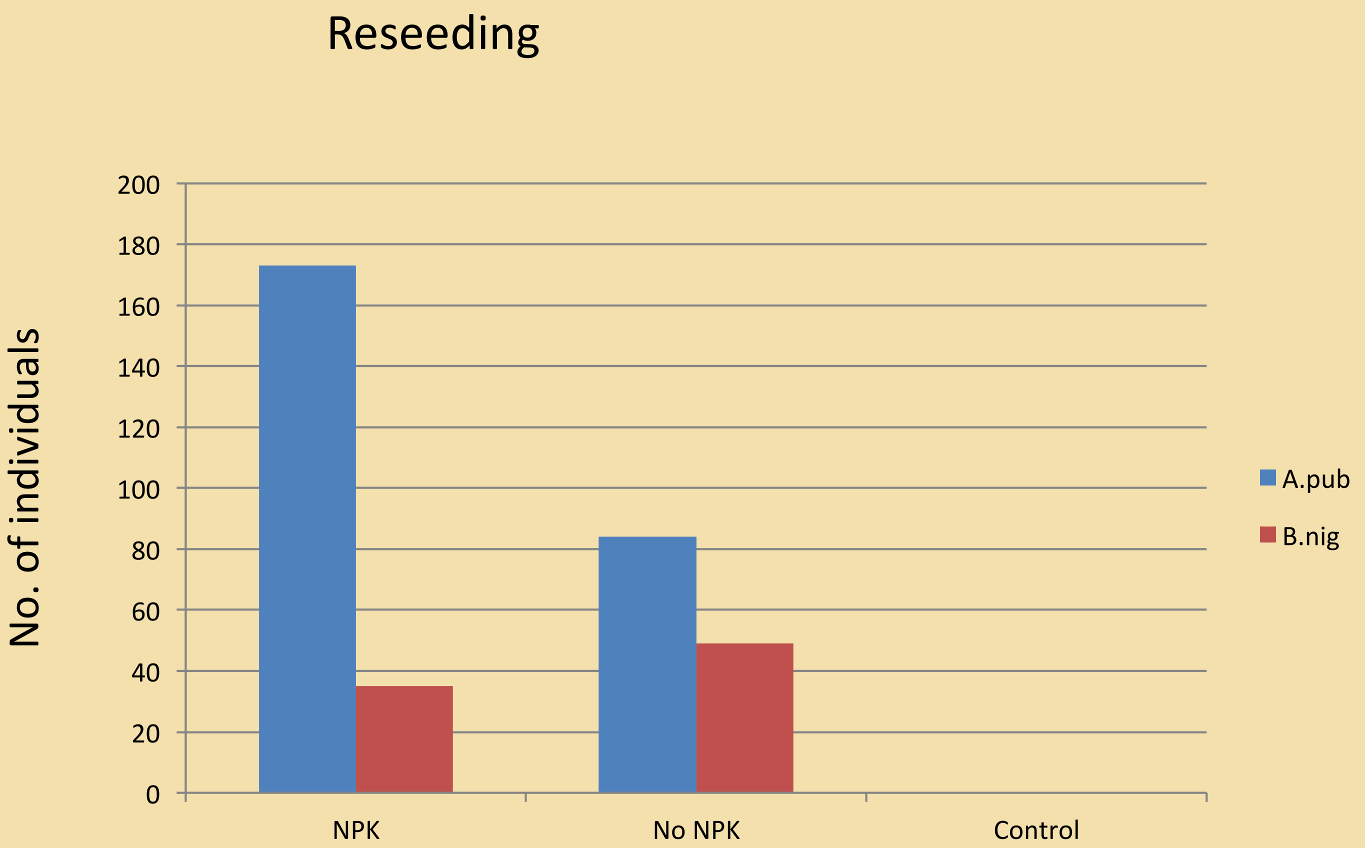

Figure 2. The comparison of target species found in the different treatments in 2017

Results and discussions

Table 1. A comparison of vegetation change over the two years in frequency(%) and relative cover(%)

	Relative cover (%)		Frequancy (%)	
Species	2016	2017	2016	2017
Brachiaria nigropedata	0	1.4	0	38.3
Anthephora pubescens	0	5.3	0	66.7
Eragrostis porosa	3.9	5.7	62.5	16.7
Urochloa brachyura	62.6	34.5	100	91.2
Tribulus terrestris	4.8	0.3	66.7	8.3
Sida cordifolia	8.0	7.4	100	89.6
Commelina bengelensis	0.7	1.1	41.7	41.7

Results and discussions

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Soil properties influence

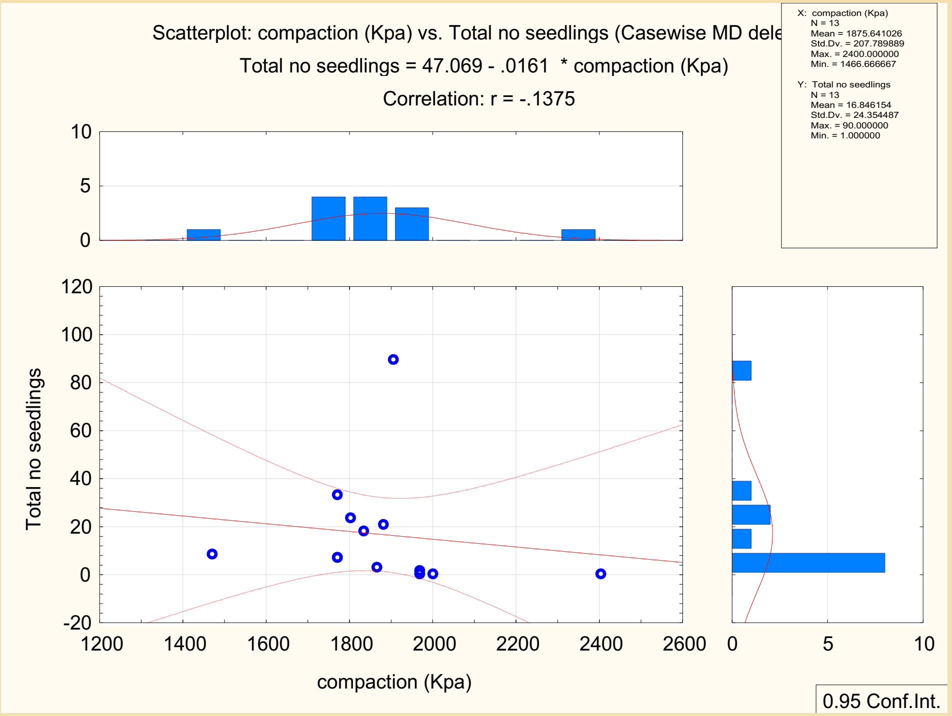

Figure 3. the effect of compaction (kpa) on the establishment of A.pub

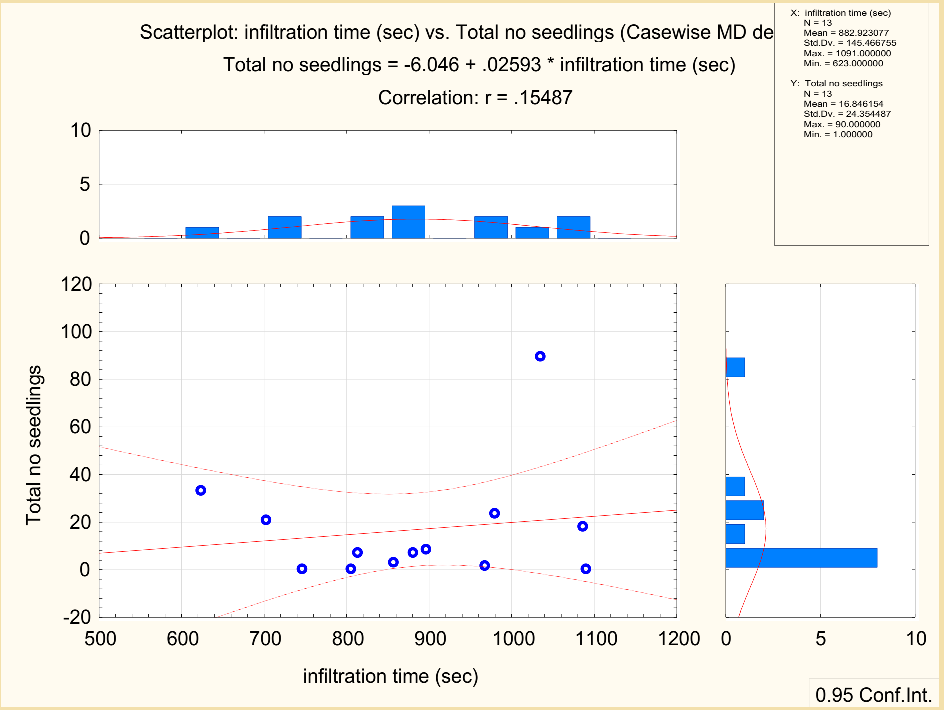

Figure 4. The effect of infiltration time (sec) on the establishment of A.pub

Results and discussions

Competition influence

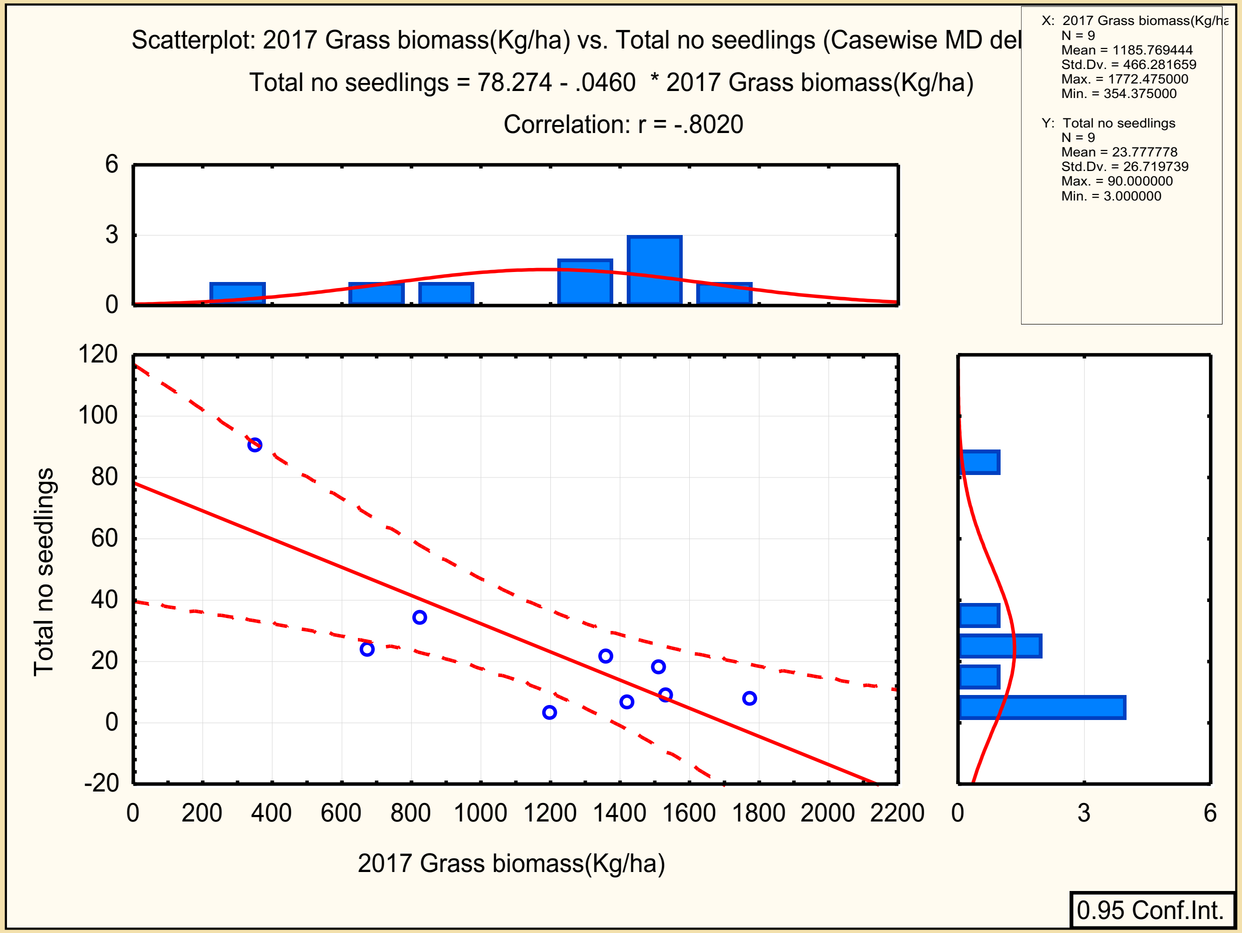

Figure 5. The influence of grass competition on the establishment of A.pub

Results and discussions

Biomass/Production

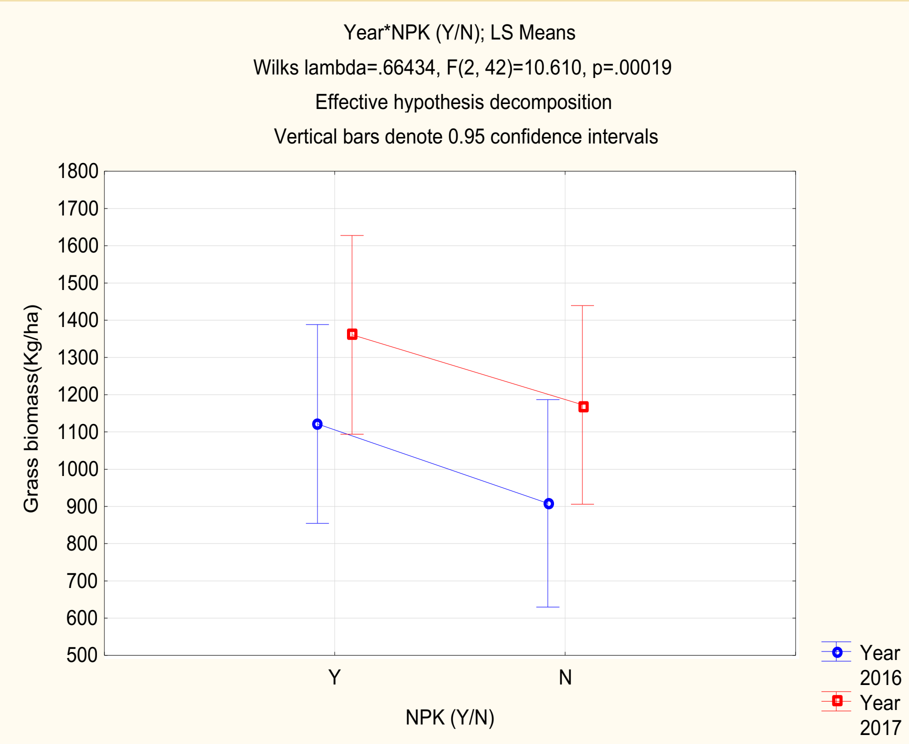

Figure 8. Grass biomass (Kg/ha) of 2016 and 2017

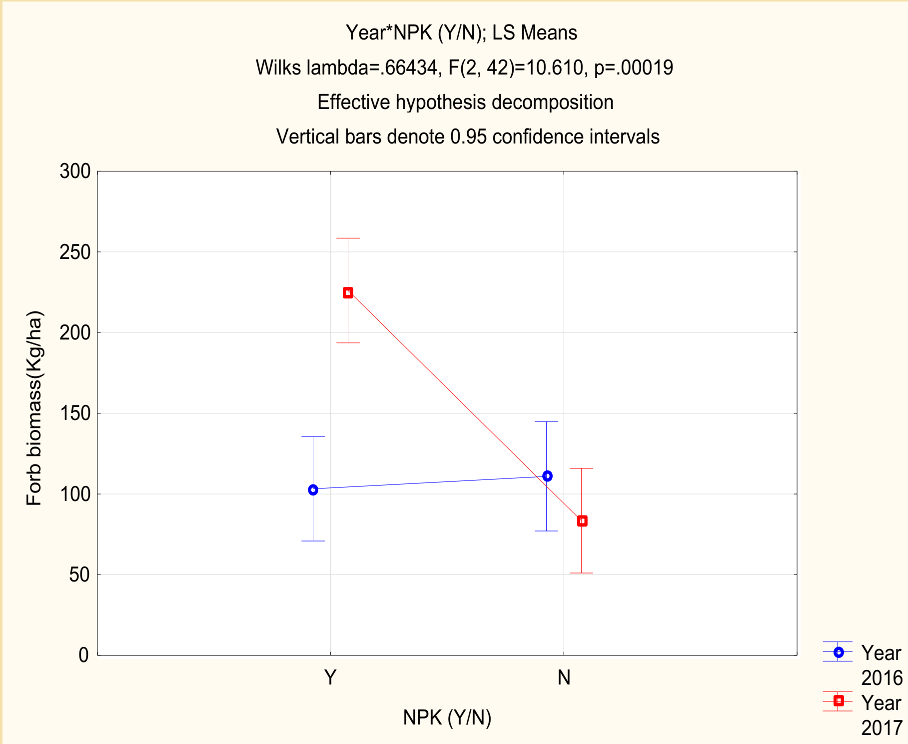

Figure 9. Forb biomass (Kg/ha) of 2016 and 2017

Take home message

- Climax grass seeds require large amounts of water to wash out germination inhibitors.
- Conditions too “hostile” in first growing season but there is evidence of succession in the herbaceous layer
- Competition in the area may have a negative influence on establishment
- Soil properties and hydrology more important than nutrients
- Restoration is not a fast technique one should expect failures but do not give up!!!!

Acknowledgement

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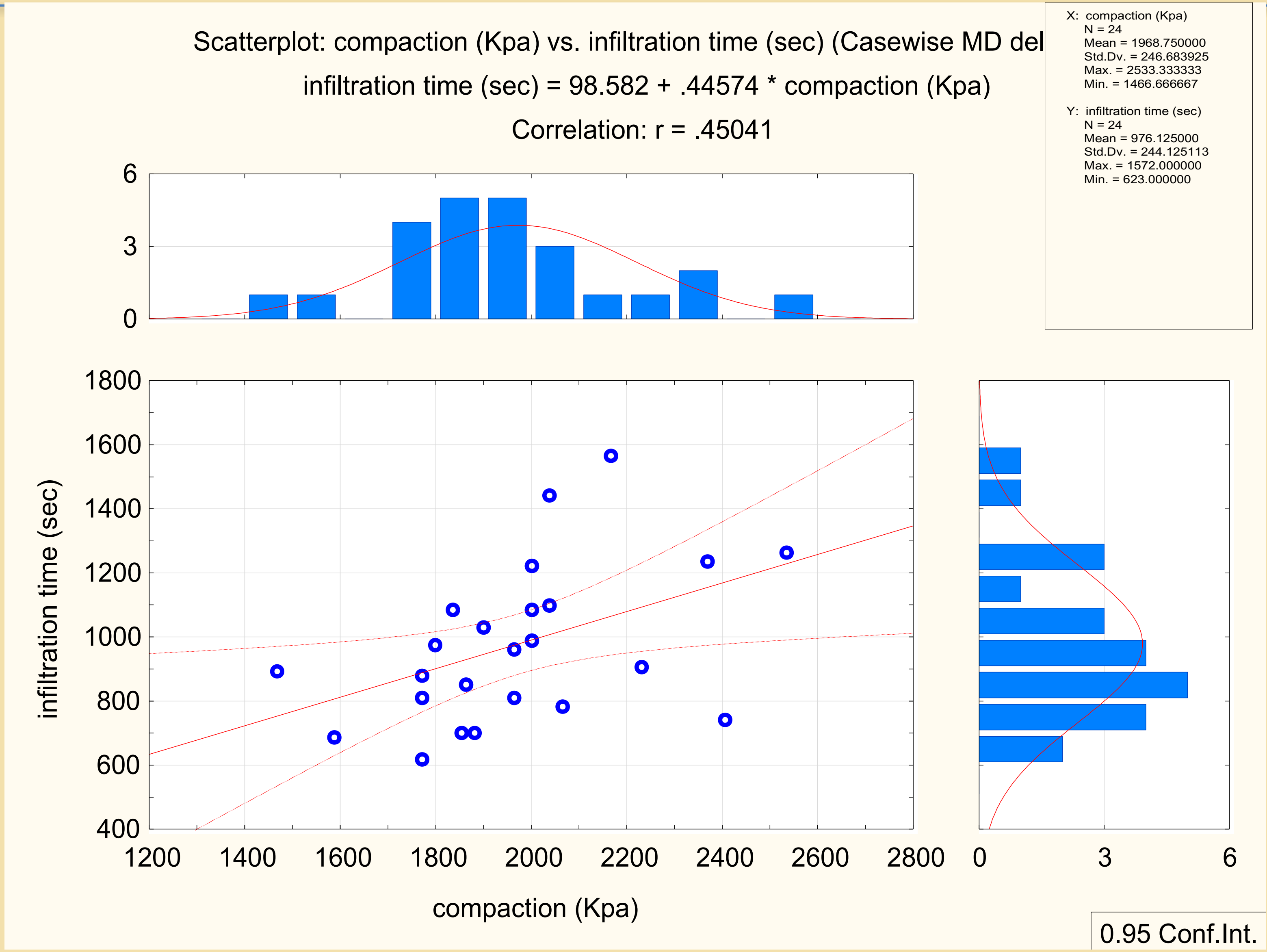
Thank you for your attention!

optimass@uni-potsdam.de
www.optimass.org



Scatterplot: compaction (Kpa) vs. infiltration time (sec) (Casewise MD del
infiltration time (sec) = 98.582 + .44574 * compaction (Kpa)
Correlation: r = .45041
X: compaction (Kpa)
N = 24
Mean = 1968.750000
Std.Dv. = 246.683925
Max. = 2533.333333
Min. = 1466.666667
Y: infiltration time (sec)
N = 24
Mean = 976.125000
Std.Dv. = 244.125113
Max. = 1572.000000
Min. = 623.000000
infiltration time (sec)
compaction (Kpa)
0.95 Conf.Int.