

INTERNATIONAL CONFERENCE AND  
WORKSHOP

***Soil Classification: a powerful tool for  
planning Soil Conservation***

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Riga, Latvia

*Organized by*



*and by*

**Latvijas Augsnes zinātnes biedrība**  
**Soil Science Society of Latvia**

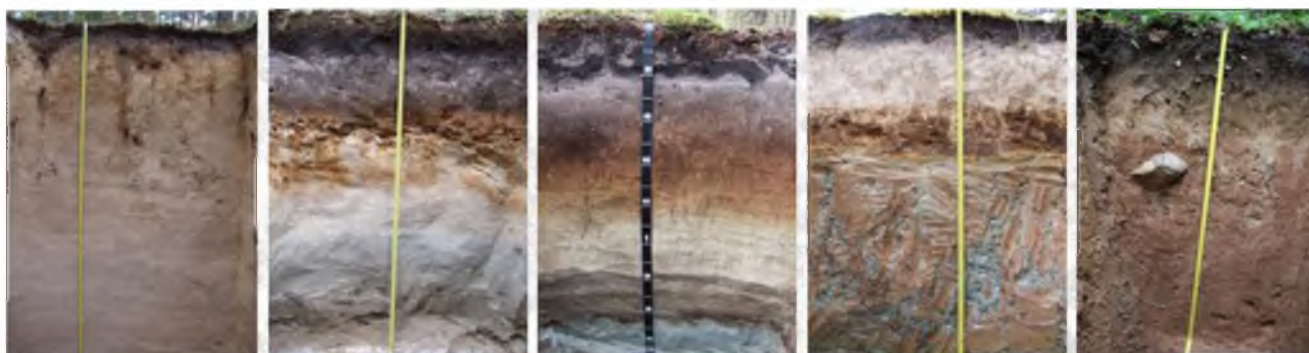


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## Rationale

Soil classification has been largely used as a proxy for soil qualities. Knowledge of soil types is essential in planning soil conservation measures. Traditionally, this activity has been carried out by National and Regional Soil Services, at the detailed and semi-detailed scales, but also by International bodies, especially at the broad scales. However, the use of soil classification for the specific implementation of soil conservation measures at the local scale remains challenging. The development of the WRB Soil Classification System has progressively improved the characterization of the functioning of soil systems, thus improving our understanding of soil processes and soil functional qualities for both agriculture and the environment.

The Conference will bring together expertise and examples of the use of soil classification for the implementation of soil conservation measures and intervention plans at different scales and for different purposes. Interactions between experts in soil classification, soil conservation planning and soil mapping are encouraged.



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### Homepage:

<http://www.azb.lu.lv/eng/> or <http://www.azb.lu.lv/home/international-workshop-soil-classification-a-powerful-tool-for-planning-soil-conservation/>

### Venue:

The Academic Center for Natural Sciences of the University of Latvia, Riga  
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The Academic Center for Natural Sciences of the University of Latvia, Riga, the Venue of the workshop

## **Phytoreclamation Possibility of Restoration of Fertility Anthropogenous – Degraded Deserted-Sandy Soil, Passed in Blown Sandy Barkhans**

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### **Introduction**

Almost all territory of Republic Kazakhstan belongs to the greatest drain less to planet area where in his deserted and semi-desertic zones owing to her physic-geographical features, sandy soils were widely adopted to Balkhash-Alakul and Ile depressions.

The analysis of a tendency of change of temperature of a ground layer of air of the given territory for 1935-95y.y. have shown – increase of her average annual size on 1.4°C, and for the vegetative period on 1.0° and on 2°C for October-March, i.e. the summer became hotter, and the winter is warmer. On the scale of a planet, since 1980year till now, the average annual temperature of air has raised on 0.4°C. Such phenomenon on a planet, it was not observed last 1000 year. Available forecasts of global warming of a climate in the come century specify that warming on 1°C will promote distribution of an arid zone as on the north, so on the south.

Here from the middle of 90th years of the last century in connection with dispersal public cattle breeding state farm in small farms on places of their parking for rather short period (5-7 years) deserted-sandy soils being degraded were transformed to mobile sandy barkhans. They became the companion for each farm, creating, and weight of inconveniences of ecological, social and economic character. We for definition of phytoreclamation possibility of their fastening by us in 2015 year study dynamics of a relief, agrohydrological and microclimatic features.

### **Materials and Methods**

Objects of research by us choose the center, consisting from average hummocky the sandy barkhans, resulted anthropogenous degradation deserted-sandy soils on a parking lot of a farm of «Bakbakty» (Figure 1).



Figure 1. Sandy barkhan near the Bakbakty village

For determination of survival of saplings of sand binding cultures on mobile sandy barkhans are defined temperature condition in the first decade of every month by measurement of temperature of the soil by the spirit soil thermometer at depths of 0, 20, 40, 60, 80 and 100 cm, and water - by sampling of soils in aluminum bugs from depths the 0-20, 20-40, 40-60, 60-80 and 80-100cm with the subsequent determination of humidity by drying in the thermostat at a temperature 100-105°C to constant weight. Determination of temperature and sampling of the soil on humidity were carried out in a middle part of a windward slope of sandy barkhans. Frequency of definitions triple. Definition was carried out in 13<sup>00</sup> local time.

### Results and Discussion

Studying of seasonal dynamics of the thermal and water regimes middle hilly of a sandy barkhan, extended from the northeast on the southwest of 25×18 and 6m in size, created in the sandy massif at the village of Bakbakty was shown about similarity of their indicators with small hilly barkhans of farm of Nurlanbek (tab. 1).

Table 1. Temperature regime (C°) of a blown sandy barkhan near the Bakbakty (2015 yr)

Depth, cm	Temperature (C°) by months of the year					
	IV	V	VI	VII	VIII	IX
0	34,0	58,1	47,0	47,0	50,0	48,0
20	18,2	22	29,0	29,0	29,1	26,5
40	16,7	19,1	23,0	23,0	28,2	23,0
60	15,4	18,0	21,5	21,5	27,9	22,0
80	14,2	16,9	20,9	20,9	27,0	22,0
100	12,5	15,1	19,5	19,5	26,2	21,8

Here, just as at small hilly, temperature increase of a layer by the 0-40cm increases from 20 °C (in April) reaching a maximum in August (29 °C) with further slow decrease to 25 °C in September.

In the nature of dynamics of the water regime middle hilly of a sandy barkhan it is observed the same changes, as at the small hilly (tab. 2).

Table 2. Dynamics of field moisture of sandy barkhan near the Bakbakty (2015 yr)

Depth, cm	Moisture (%) by months of the year				
	V	VI	VII	VIII	IX
0-20	1,98	4,47	0,46	0,30	1,64
20-40	3,84	1,07	2,77	2,92	2,41
40-60	3,15	2,19	4,48	3,19	2,31
60-80	2,02	4,07	4,75	3,04	2,62
80-100	-	2,70	3,89	4,34	2,75

As appears from data of the table the humidity the 20-40cm a layer where the bulk of root system of saplings settles down, decreases from spring (3,84%) by fall (2,40%). At the same time hot summer months of aeolian processing of the dried-up surface of a destructive and accumulative part of a sandy barkhan falling asleep by her dry layer results from sand or blowing off of the existing layer, recorded at previous measurements. In our case in time between 5:05 and 5.06.2016 falling asleep of a surface of the top accumulative part of a windward slope of a

barkhan by a sand layer on 38 cm is observed that has affected humidity of a sandy layer the 20-40cm having lowered it to a minimum (1,07%).

Thus, studying of the spring summer-autumn hydrothermal regimes is fresh sandy barchans formed small hilly and having more semicentennial age the middle hilly have shown about low probability of survival of saplings of sand binding forest-bushes, connected from low field humidity of a root layer of soil (20-40cm), decreasing from spring by fall from 5,0 to 2,5% (wilting moisture 1,7%) in the conditions of high temperature (25°C) and low relative humidity (29%) of a ground layer of air in summer months.

### **Conclusion**

The following conclusion allows us to make results of researches:

- sandy soils were widely adopted in a desert zone in the republic and are the main region of distant-pasture livestock production.
- anthropogenic degraded desert sandy soils transforming to the blown sandy barchans became attribute of parking lots of country farms and settlements, engaged in livestock production;
- decrease of field humidity since spring by fall from 5,0% to 2,5% should consider feature of the water regime of a layer of an arrangement of root system of saplings (20-40cm) insufficient for cultivation of saplings of sand binding forest-bushes.

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