

RAIN WATER STORAGE CAPACITY OF GRASS AND PINE NEEDLES

by

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INTRODUCTION

This voluntary paper deals with some measurements on the rain water storage capacity of some soil covers. It took place in Bogdanas torrent catchment basin in Greece.

Trying to find out the infiltration rate on a variety of plots, containing denuded, recently reforested and 42 years old reforestation, I thought to measure also the height of rain water that could be held on such areas, by the naturally existing soil cover.

This covers were:

- on denuded areas existed a layer of stones (\varnothing 1-2 cm), created by surface erosion, and some bunches of grass (*Andropogon* sp.) covering about 25% of the surface,
- on newly reforested areas (*Pinus nigra*, 7 years old) and because of plowing and deep soil (40 cm), existed a rich grass cover of *Agrostis alba*, that occupied the all surface,
- on 42 years old reforestation of *Pinus brutia* (chest diameter 25-35 cm, 12,00 m tree height), the soil surface was covered by a 3 cm thick layer of dead pine needles, in every stage of decomposition.

METHOD OF MEASURMENTS AND RESULTS

It is clear that the first type of soil cover has not a remarkable rain water storage property. From the other two surfaces (grass and pine needles) I took out 6 square slates (3 of each type) measuring 15X15 cm and removed every inorganic material by the aid of a mild water jet. Every slate was put on a piece of wirecloth, previously weighed, and air-dried to constant weight (about 24 hours, temperature 28° C).

After the estimation of the air-dried weight of every slate they were abundantly sprayed by a shower. The time water dropping from the wirecloth stopped, every slate was weighed in wet but not dropping condition. Average (for 3 slates) measurements were:

	Grass	Pine needles
Dry weight (gr)	598,0	240,0
Wet weight (gr)	927,0	582,0
Difference (gr)	329,0	342,0
Difference (%) (on dry weight)	55,0	142,5
Water height (mm)	15,2	15,8

CONCLUSIONS

It seems that some soil covers, dead or live, have hydrological properties comparable to those of plant cover. Crown storage capacity of *Pinus brutia* stands is only 2,7 mm (Kotoulas, 1972) instead of 15,8 mm for pine needles cover and 15,2 mm for grass. Of course, annual interception of tree crowns must be bigger (30 % of the annual rain for *P.brutia*), because they are quick drying.

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