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Desert Emergency - Lack of water — How to Find and Collect
Water. Plants and Human Survival in the Desert.

The Principal Investigator and Contractor:
Professor Yitzchak Guterman

Contract Number: DAJA 45-93-C-0051

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November 83 to February 84

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) → It is impossible to relate anatomic and morphologic traits of the plants with the water condition of the roots, thus making it possible to select those plants having the highest potential water yield. It has been determined that enclosing a branch consisting of living foliage in an impermeable membrane, such as a plastic sack, results in heat stress which inhibits transpiration. Alternative methods of collecting transpiration water are being sought. Preliminary evidence suggests that the rates of transpiration are not uniform on all sides of a plant.		

1. Scientific work - From the topics presented in the research program we chose to concentrate, during the first period, on the subject of collecting transpiratory water from desert plants.

a. With the purpose of developing a simple method for everyone by which it is possible to choose, from a large group of plants, the particular plant which should be covered by PVC in order to get the maximum possible yield of transpiratory water.

The water condition at the root system is one of the major factors influencing transpiration. However, since the roots of a plant such as *Retama raetam* can reach 25 meters, it is impossible to directly determine the water condition in the root system. Therefore it is important to find signs on the leaves and stems that could indicate the water condition in the root system of different desert plants. It is possible to relate anatomic or morphologic traits of the plants with the water condition of the roots. Research of this sort will enable us to find factors that would be easily determined by sight in order to identify the plants most feasible to be covered for giving the maximum yield of transpiratory water.

b. In the closed sack the branches overheat, which damages the plant and stops the transpiration flow. Another aim of the research is to develop a method for obtaining maximum yield of transpiratory water, that would be based on scientific knowledge as related to rates of transpiration in accordance with air humidity, temperature, radiation intensity and time of day that the plant is covered.

In accordance with the data collected we can determine if a given plant should be covered and on which side (north, south, etc.).

c. It is important to improve the method of covering the plant in order to get the maximum transpiratory water.

2. In the next stage we will exploit the knowledge gained to develop a similar method by which we can use plants in order to find groundwater close to the surface.

3. For the field work carried out simultaneously with the laboratory work, in addition to the principal investigator, two technicians are also working on the project - Mr. Aitan Bar Levav and Mr. Amir Chaklai. For this work we need to purchase thermohydrographs, thermometers, and other specific equipment.

Since, some of the equipment needed for this research has already been purchased with the university budget, I am pleased to inform you that without changing the budget requested, I am able to purchase the equipment needed for the research.



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