IrrigationNets

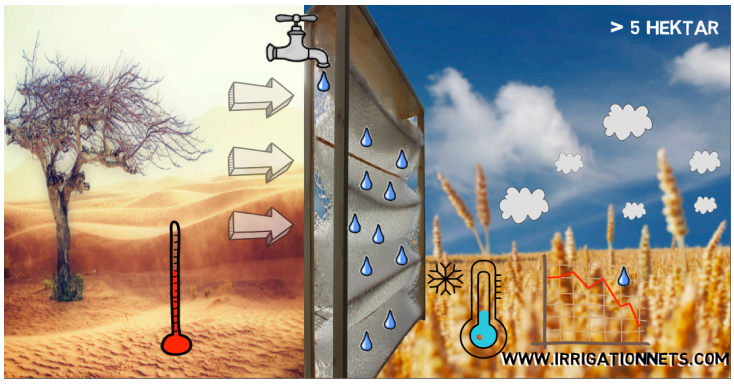
Drought Control Through Indirect Salt Water Usage

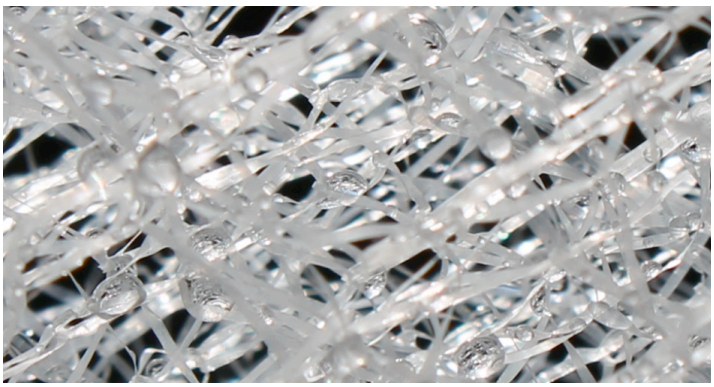
Many farms suffer from water shortages. One solution is to desalinate seawater. But for use in agriculture, standard desalination processes are usually too expensive. With our indirect saltwater usage through an agriculture-saltwater-humidification system we offer farms close to the sea or those that have saline groundwater a new hope.

Our systems convert seawater into salt-free wet air that spreads over a large area and supplies plants with regular humidity. The installation can be turned on and off to regulate the amount of water applied.

The moist air produced is also cooler than the naturally circulating air and thus helps the plants to reduce water needs and prevents excessive water loss to evaporation. Overall plant stresses are reduced, and yields increase.

Even though our technology is no real replacement for urgently needed reforestation, through broad application the cooling and moisturizing effect of forests can be achieved. Which in turn leads to more precipitation. Through the increased rainfall groundwater levels will eventually increase and seawater intrusion into aquifers is avoided. The morning dew created by the technology will spread over a large area and help the environment to restore plant ground cover. Additionally, the systems work to purify air.





Mode of Operation

A pump spreads the saline water over our special cooling nets. In the nets millions of tiny water droplets hang in the air. Because the water drops don’t burst, almost no salt molecules are released into the air.

The incoming warm and dry wind is cooled and moisturized by the saltwater and thus plants over a large area are supplied with additional amounts of morning dew.

The moisturizing systems stand crosswise in wind direction at the edge of the fields. The warm and dry wind is cooled and moisturized. The improved micro climate leads to a lower watering needs of plants and reduces salting of soils.

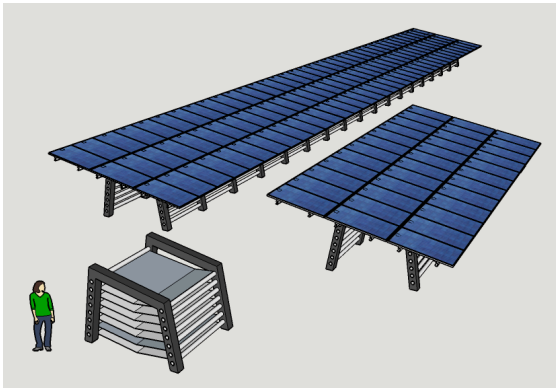
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Applications

Combinations with Photovoltaic Plants

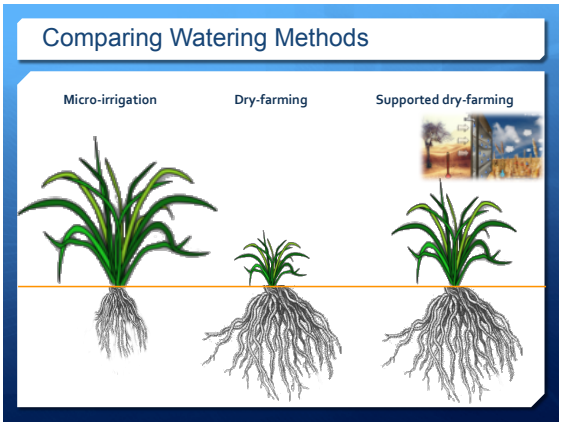
Solar cells that are cooled – depending on type – will bring 5% to 20% more output. Additionally, ware and tear is reduced and life span of the cells is increased. These effects alone are sufficient to offset the costs of our saltwater system.

The main advantage, though, lies in the improved land-lease negotiating position of photovoltaic part operator vis-à-vis farmers. The farmer benefits from letting part of his land to the operator in exchange for the increased humidity applied to his field. The operator benefits from lower land lease costs.



Dry-farming

In dry-farming our technology improves yields substantially because even small improvements in humidity lead to large effects. The standard advantages of dry farming like “larger root network”, “higher nutrient uptake” and “healthier and more aromatic plants” are maintained and even enhanced.



Supportive Humidification

For plants with high water needs the system can be used as an affordable extension to existing irrigation systems. The water needs of the plants can thus be reduced by up to 50%.

Meadow Husbandry

Pastures benefit from the extra moisture and build better root networks which makes them stronger and leads to quicker regrowth after grazing.

Path Wetting in Open-cast Mining

In open-cast mining the path and road networks needs to be wetted to prevent rood dust swirling. Through a general moisturizing of the mine, water needs for dust reduction is reduced by up to 50%.

Land Recultivation in Arid Regions

The above described rain-effect allows for renaturation of arid regions if installed in large numbers. Where constant humidity is applied life starts to germinate. In partnership with solar park operators, governments can through private-public-partnerships increase arable land. The government lets land to the operators which in turn supply the region with humidity.

Air Purification in Cities

Because of the above described air purification effect of moist air, the system can be used to improve air quality in cities. The cool water which is a by-product in this setting can be used to cool buildings. Again, public-private-partnerships between industries who need cooling water and city governments are feasible.

Risk Analyses

Salinization

Trials with oversaturated salt solutions left to dry in the nets lead to the expected salt crusts agglutinating the nets. Most of the salt crusts can easily be washed out even with oversaturated salt water, which leads to salt crystals accumulating below the installation. Salt crystals are completely removed through flushing of the nets with fresh water.

Sand Aggradation

In tests we placed sand in the nets to check whether it could easily be removed through water flushing, which was the case. We cannot rule out sand crustification of the nets because so many different types of sand and dust exist. But because of the wind movements and the continuous water flow such a crustification is unlikely.

Microbial Contamination

Due to the high salinity the nets are constantly decontaminated from microbes.

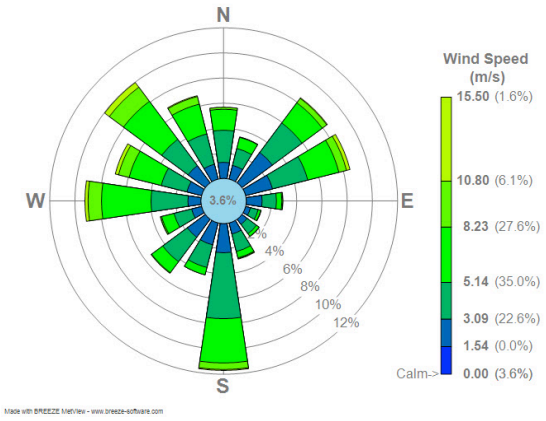
Durability

Plastic disintegrates with UV irradiation, heat, chemical stress and tensile stress. Our nets have additives inbuilt to protect against UV irradiation and a roof atop the installation provides further protection. The nets are exposed to temperatures of 10 to 45 degree Celsius which they can withstand easily. The high salt concentrations are a stress too but the nets can tolerate the amounts handled. The nets are attached to the supporting installation with many mounting brackets to provide a slight but continuous and equal tensile strain.

Extreme Weather Situations

When an extreme weather situation approaches, the nets should be cleansed first by running seawater through it, followed by some fresh water to remove all salt from the nets. Otherwise the salt rests could be blown out of the nets by the storm and spread over the field. The cleaning can be done automatically.

The nets have low wind resistance and won't be damaged much by bad weather. However, the system allows for the nets to be retracted to be taken out of the wind.



Salinization of Near Range

An area of 2 to 3 meters around the installation will receive saltwater droplets that are blown out of the nets by the wind. Within this parameter the installation is fitted with a water storage basin to prevent soil salination.

Vandalism and Theft

Vandalism must be avoided through elucidation of the public and where necessary security services. Theft is managed by building small GPS trackers into the product.

Removal of Sand and Salt

Any left-over sand-salt mixture will be disposed of into the sea. This leads to increased salt concentrations. But the amounts so disposed are very small compared to industrial desalination plants.