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HOMEODYNAMIC AGRICULTURE: RESULTS IN CONDITIONS OF WATER SCARCITY

For many years, the International Research Institute EUREKA has worked with the challenge of drought in agriculture, developing a method of cultivation (known as 'homeodynamic' agriculture) and innovative devices that allow one to obtain economically viable yields even under conditions of water scarcity. At the same time the method aims to improve the fertility of the cultivated arid or semi-arid soil. An example of the outcome of a trial of these methods is presented here.

THE TRIAL

From April to November 2012 pepper variety "Eppo F1" was grown in a polytunnel. The aim was to assess whether the homeodynamic method could offer a viable alternative to standard organics, measured as yield under conditions of reduced water availability.

MATERIALS AND METHODS

One portion of the seed was treated with the homeodynamic product "S06-Antisiccità[1]", with another portion left untreated as a control. The treatment of the seeds consisted of a spray with a mist of "S06-Antisiccità", at the rate of 3 ml of product per 100 grams of seed which was then sealed in a container for 1 hour.

The seeds were then placed in seed-plug trays (on 4/16/2012) and irrigated until the seedlings were ready to be planted out in the polytunnel to control the water supply during the subsequent stages of growth.

The seedlings from both the treated and untreated seeds were planted into separate rows divided into three identical sectors each consisting of 13 plants. This enabled isolated irrigation regimes using Dripline (Model Tandem, 16 mm tube, capable of delivering 6.3 litre / meter via drip holes every 33 cm each disbursing 2.1 litres / hour) divided into 3 sections of equal length (serving 13 pepper plants each with the rows 65 cm apart) using taps placed in series in the row to adjust the rate and thus the volume of water delivered. Thus the polytunnel plants were given 3 different

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[1] Antisiccita – and Italian word for 'anti-dryness' or 'drought resistance'.

irrigation volumes (100%, 75% and 50%) for both the treated and untreated seeds giving a total of 6 sections for comparison.

Control (organic) plot

Homeodynamic plot

RESULTS

Compared to the organic control, the pepper plants treated with S06-Antisiccità showed an increase of both the green matter and the average production per plant. This is shown in Table 1.

TABLE 1:
INCREASE IN GREEN MATTER AND FRUITS

IRRIGATION (%)	PERCENT INCREASE IN GREEN MATTER	PERCENT INCREASE IN FRUITING
100	+18	+3
75	+91	+43
50	+119	+78

DEVELOPMENT OF GREEN MATTER

Enlarging upon the data above, let us now consider in detail the volumetric increase of green matter (Table 2.)

TABLE 2:
VOLUMETRIC EVALUATION OF GREEN MATER ON 12.09.12

IRRIGATION	ORGANIC CONTROL (cm)			HOMEODYNAMIC (cm)		
	Mean height (cm)	Mean spread (cm)	Mean volume (cm)	Mean height (cm)	Mean spread (cm)	Mean volume (cm)
100%	64	47	111	67	50	131
75%	59	38	67	72	51	147
50%	62	40	78	73	51	149

All the data - height, diameter of spread and average volumes of pepper plants were greater in the homeodynamically treated plot compared to those in the organic control. The percentage increase of each parameter is specified in Table 3.

TABLE 3:
PERCENTAGE INCREASE OVER ORGANIC CONTROL

PARAMETERS RELATED TO GREEN MATTER			
IRRIGATION	PERCENT INCREASE		
	Mean height	Mean volume	Mean spread
100%	+6	+6	+18
75%	+22	+34	+119
50%	+18	+27	+91

Table 3 shows that the increase in green matter of the pepper plants in terms of average volume is significantly increased for all homeodynamically treated samples compared to the corresponding sections of the organic control.

YIELD

Early production: the homeodynamically treated seeds produced peppers on 9/29/12, 5 days in advance of the organic control. The average production of peppers per plant is shown in Table 4.

TABLE 4:
COMPARISON OF THE MEAN YIELD FOR SINGLE PLANTS

AVERAGE PRODUCTION PER PLANT			
IRRIGATION	ORGANIC CONTROL (kg/plant)	HOMEODYNAMIC PLANTS (kg/plant)	INCREASE OF HOMEODYNAMIC OVER ORGANIC CONTROL (kg/plant)
100%	1.353	1.390	+3%
75%	1.171	1.676	+43%
50%	0.900	1.601	+78%

The data shows that the organic control has diminished average production per plant correlating with the decrease of irrigation. On the other hand the homeodynamic plants show an increase of mean productivity per plant with the decreased irrigation compared to the full irrigation (see Table 5).

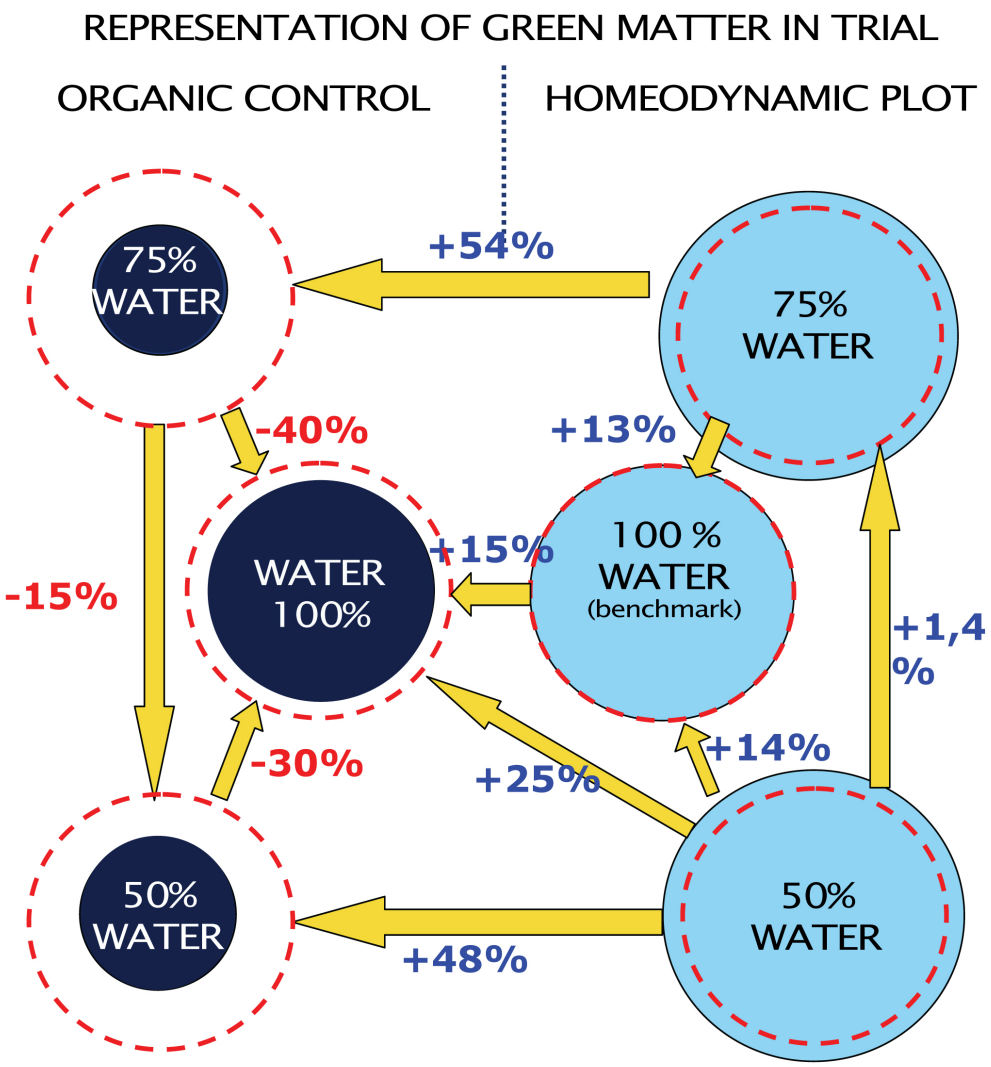
TABLE 5:
PERCENTAGE CHANGE IN AVERAGE PRODUCTION PER PLANT BETWEEN VARIOUS IRRIGATION LEVELS WITHIN CONTROL AND HOMEODYNAMIC SAMPLES

PERCENTAGE VARIATION OF MEAN PRODUCTION PER PLANT WITHIN CONTROL AND HOMEODYNAMIC SAMPLES		
Irrigation comparisons	**ORGANIC CONTROL**	**HOMEODYNAMIC**
75% referred to 100%	-13%	+21%
50% referred to 100%	-33%	+15%
50% referred to 75%	-23%	-4%

CONCLUSION

The trial suggests that the homeodynamic method of agriculture is able to produce significantly higher yields than the same plants grown with the traditional organic method, even in conditions of restricted water supply.

It is interesting to observe the difference in fruit yield of homeodynamicly treated seeds between 50% 75% irrigation rates. Here the difference is minimal (-4%). From this we can hypothesise that the contribution of the seed-bath "S06-Antisiccità" on growth and productivity of the plant, is roughly equivalent to 25% of water supply. In other words, the data derived from this trial suggests that the contribution of the seed-bath “S06-Antisiccità” allows the plant to live in drought conditions as if it were receiving 25% more actual water.



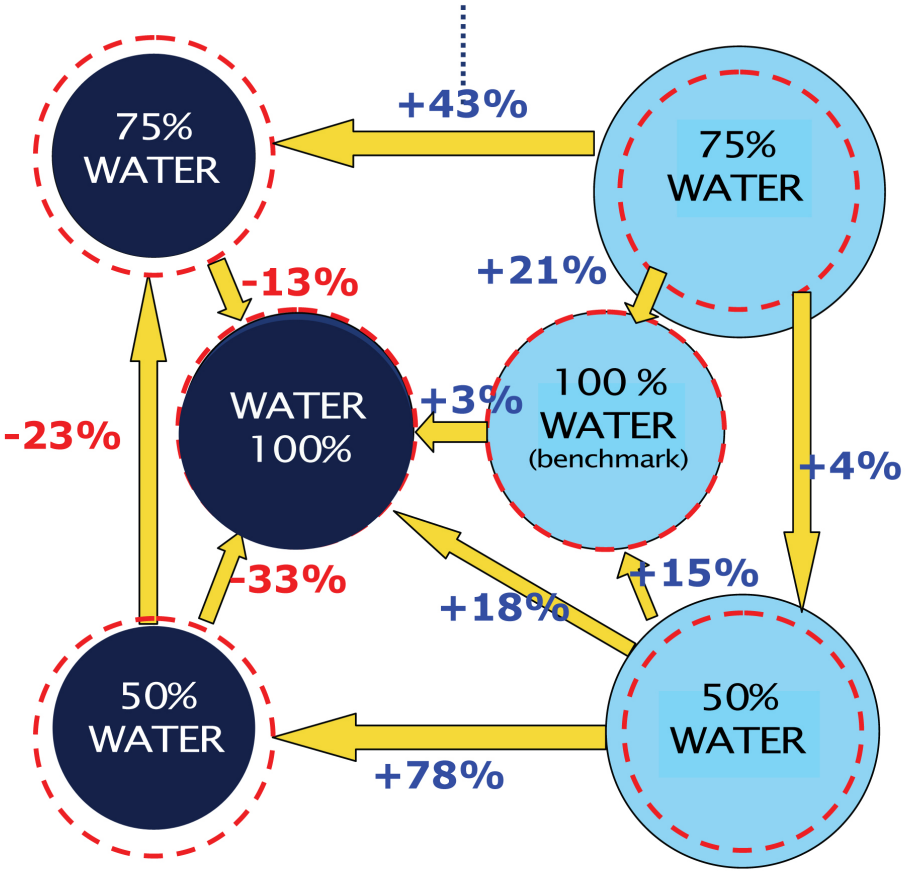
COMMENT ON GREEN MATTER YIELD

At 75% of the base irrigation rate the control showed an above-ground volume that is 49% lower compared to the benchmark (homeodynamic seedbath and 100% irrigation rate), while the homeodynamic plot showed a 13% increase in the above ground part of the plant with the same 75% of irrigation.

At 50% of the base irrigation rate the control showed an above-ground volume that is 40% lower compared to the benchmark (homeodynamic seedbath and 100% irrigation rate), while the homeodynamic plot showed a 14% increase in the above ground part of the plant with the same 75% of irrigation.

OVERALL REPRESENTATION OF FRUIT IN TRIAL

ORGANIC CONTROL HOMEODYNAMIC PLOT



COMMENT ON FRUIT YIELD

At 50% irrigation rate the control produces 0.9 kg, or 13.9 grams for every 1% of water provided. By contrast the homeodynamicly treated seeds produce 32 g for every 1% of water. This suggests that the homeodynamic seedbath "S06-Antisiccità" stimulates some ability within the plant so that irrigation water is "worth" 78% more.

The red dashed circle visually represents the benchmark of 100% irrigation and spray with the seedbath "S06-Antisiccità".

Update as of February 2013
The Research Institute EUREKA is continuing to study and research for solutions that enable agricultural cultivation even under harsh environmental conditions such as dry, cold, hot, etc.

In relation to the possibility of inducing and sustaining resistance of plants to drought, we are currently undertaking a series of experiments aimed at evaluating the impact of the homeodynamic method and new techniques and products developed by the same agricultural research institute: EUREKA.

These experiments involve testing original devices and homeodynamic products in air-conditioned cabins that reproduces the desert-like conditions (temperatures around 35° - 45°C and humidity around 25-35%). The first results of this work will be available around May-June 2013.