Water Culture

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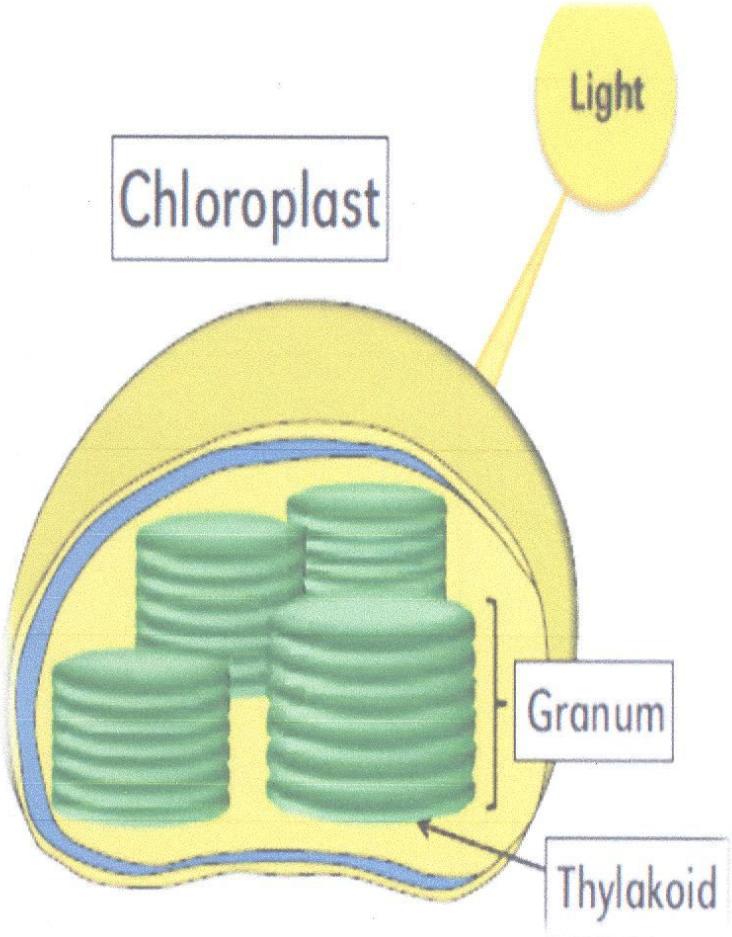
INTRODUCTION:

Magnesium has a number of key functions in plants.



Particular metabolic processes and reactions that are influenced by Mg include:

1) Photophosphorylation
(Such as ATP formation in chloroplasts).

2) Photosynthetic carbon dioxide (CO_2) fixation.
3) Protein synthesis.
4) Chlorophyll formation.
5) Phloem loading.
6) Partitioning and utilization of Photoassimilates.
7) Generation of reactive oxygen species.
8) Photooxidation in leaf tissues.
Consequently, many critical physiological and biochemical processes in plants are adversely affected by Mg deficiency leading to impairments in growth and yield.

Leaf yellowing in the form of interveinal chlorosis on older leaves is one of the typical symptoms of Mg deficiency stress, other symptom curling of leaves upward along margins and there is surprisingly little research activity on the role of Mg nutrition in crop production and quality. Hence, Mg is often considered a "forgotten element".

OBJECTIVE:

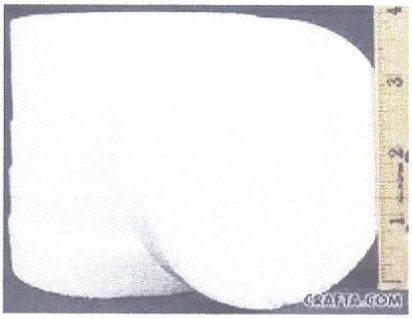
In this experiment, we will grow peppers hydroponically with in media under control condition (only water), control condition (all fertilizers N,P,k + trace element) and media (lacking of Mg) to investigation deficiency observe symptoms ,several data, changes and compare with control over several week and explain it.

MATERIAL:

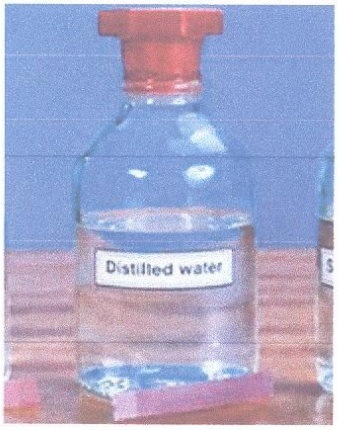
1) Pepper transplants.

2) Bottles.

3) Corks.



4) Distilled water.

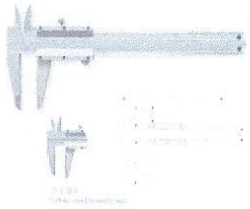


5) (N, P,K) solutions Fertilizers.

6) Trace element solution fertilizer.

7) Meter.

8) Caliper.



METHODS:

1. Unless otherwise indicated, your nutrient solutions(suitable amount of nutrient without mg) will have been prepared for you. Obtain your nutrient
solution and set-up your growth container as directed.

2. Remove your seedlings from the soil gently! The stems break easily!

3. Use the vats of water provided in lab to remove coarse soil. Finer soil should then be removed using distilled water bottles.
4. Take a twist of cork and wrap it firmly around the middle of the stem, using enough cork to support the plant in the plant holder.

5. Insert the plant in the lid, taking care that the root system is below the surface of the water.

6. Place four plants in each nutrient solution.

7. Cover the outside of the container completely with foil and tape in place to prevent grow of algae.

8. Label each container with your initials and the missing nutrient.

9. Collect your initial measurements, recording them carefully in your lab notebook. Be sure to collect

Both qualitative (change in color ,...)and quantitative data!

- Length .
- Number of leaves.
- Number of flowers.
- Diameter of stem.
- Number of fruits.
- Finally weight of plant (root ,aerial part).
- Finally weight of fruit.

10. Repeat data collections at least once per week.

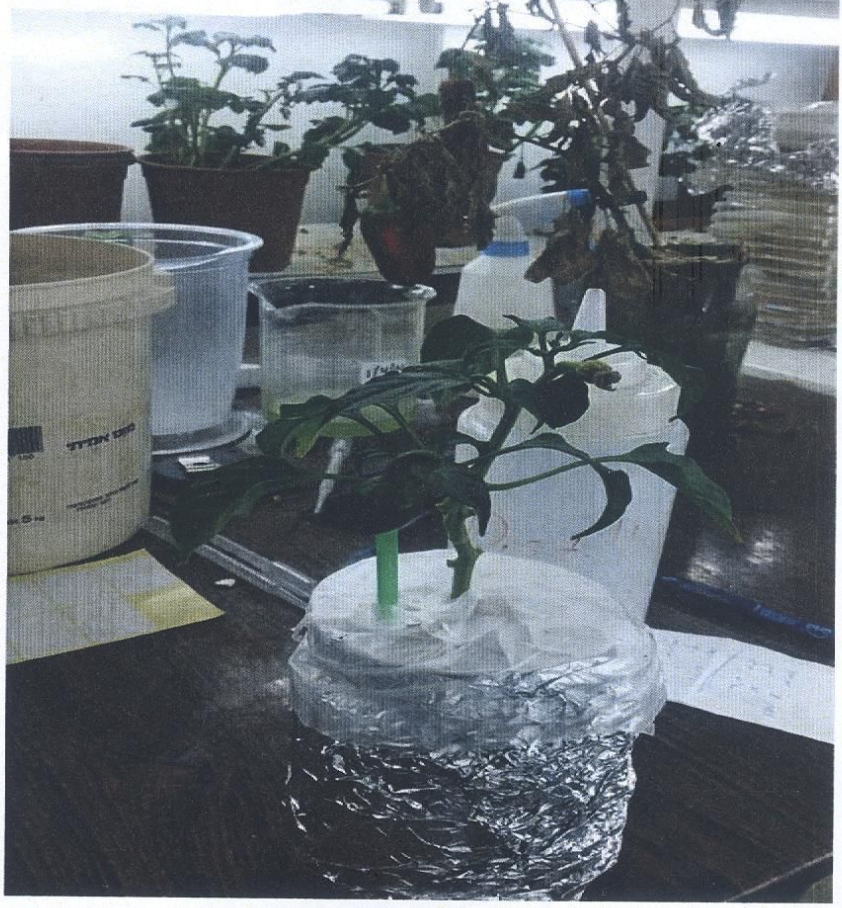
RESULTS & CONCLUSION

• Qualitative results

Leaves:

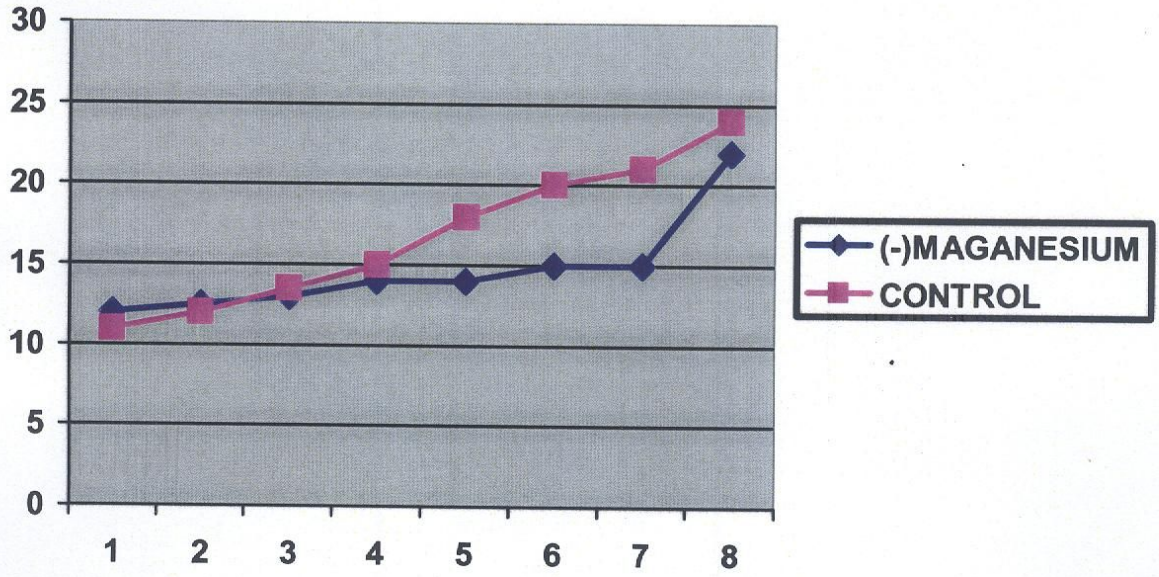
✓ Distinctive interveinal yellowing or chlorosis in the most older leaves.

- ✓ Necrotic of two older leaves.
- ✓ Interveinal chlorosis in some younger leaves.
- ✓ Development of interveinal chlorosis, together with some reddish spots on the leaf blade.
- ✓ Curling of leaves upward along margins.

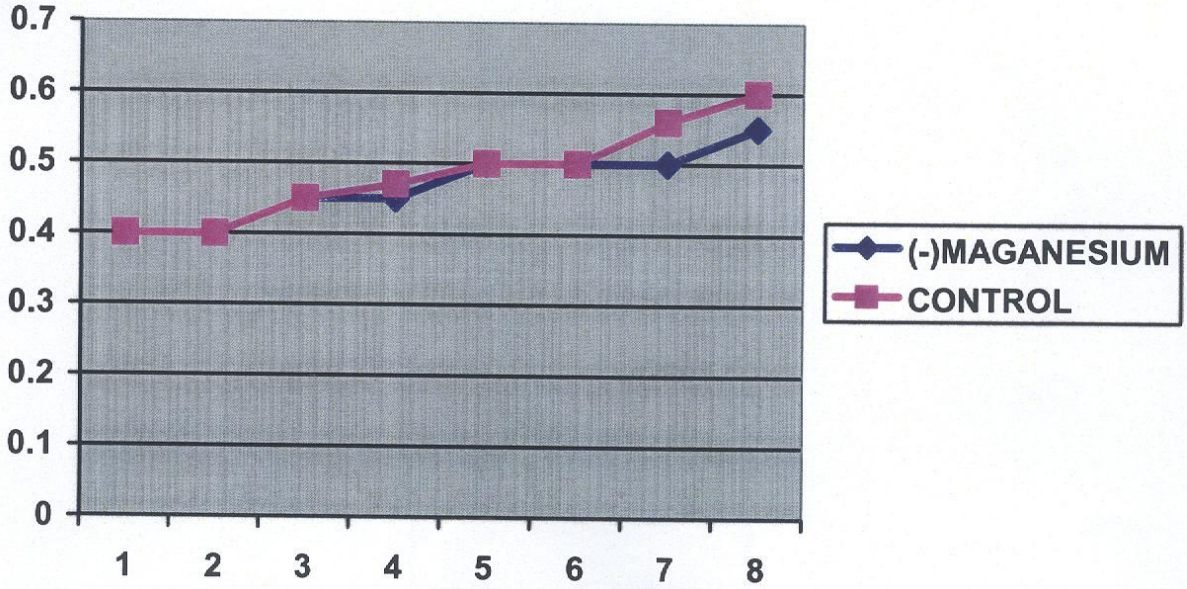


Pepper in water culture with (all fertilizer – magnesium)

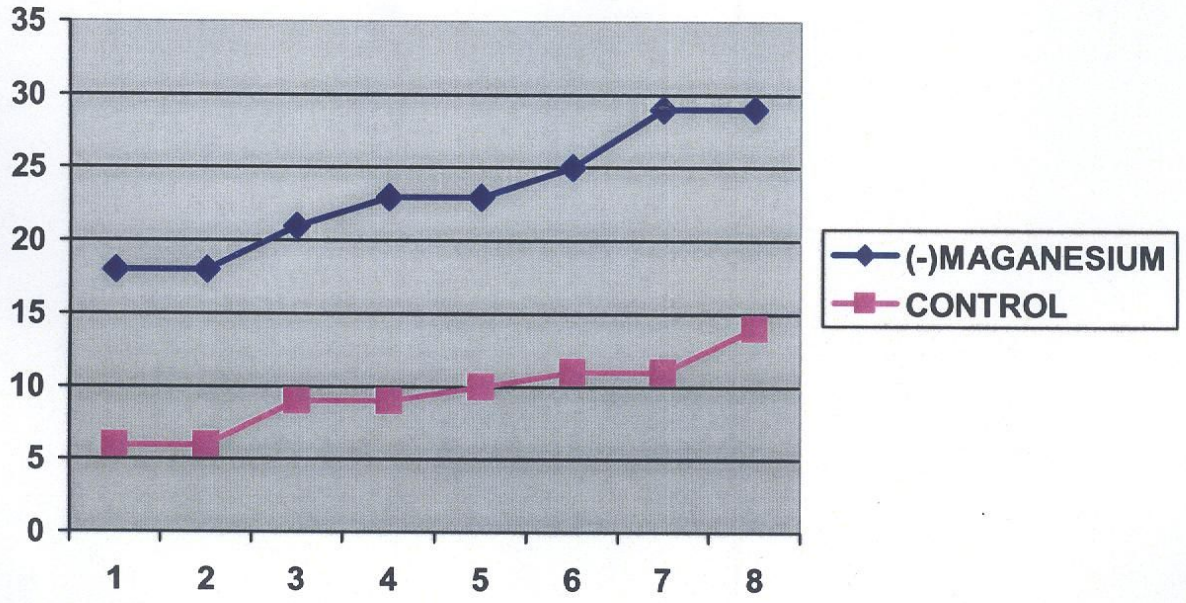
	length	width	no. leaves	no.flower	no. fruit
1	12	0.4	18	0	0
2	12.5	0.4	18	1	0
3	13	0.45	21	1	1
4	14	0.45	23	0	1
5	14	0.5	23	0	1
6	15	0.5	25	0	1
7	15	0.5	29	0	1
8	22	0.55	24	0	1



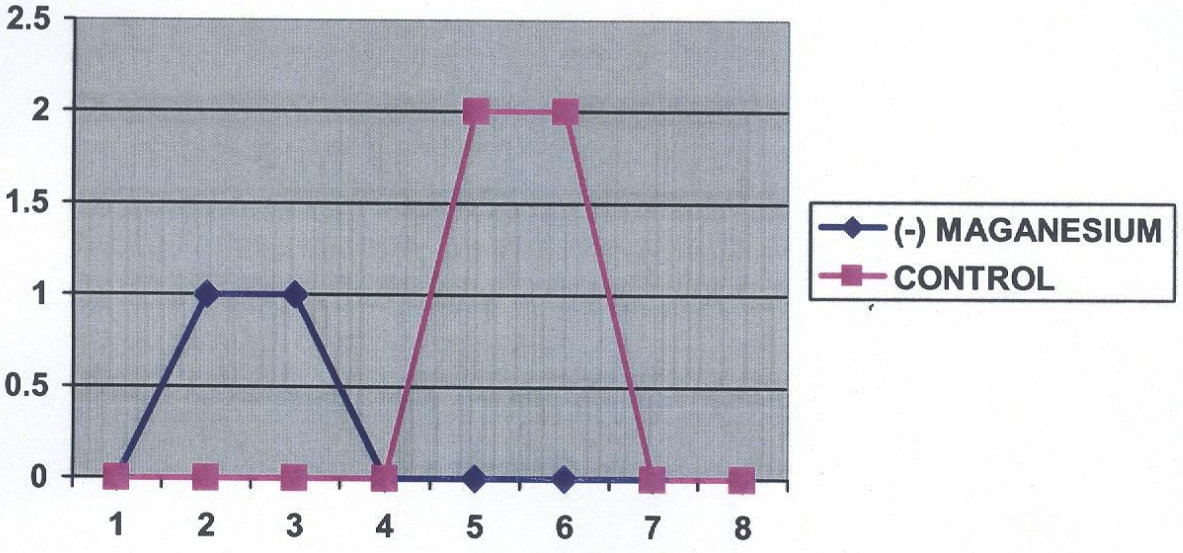
Length of pepper in aqua culture



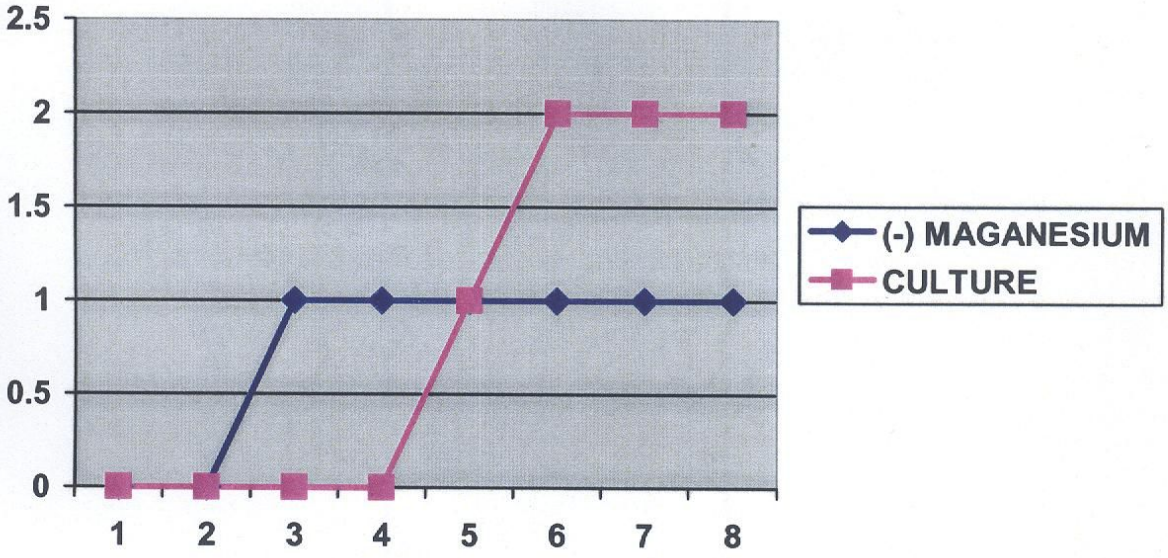
Width of pepper in aqua culture



NO.OF Leaves of pepper in aqua culture

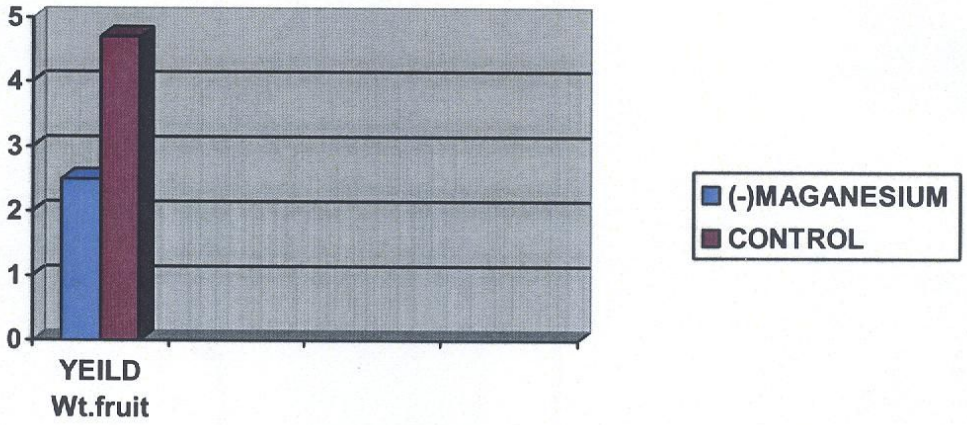


NO.OF Flower of pepper in aqua culture



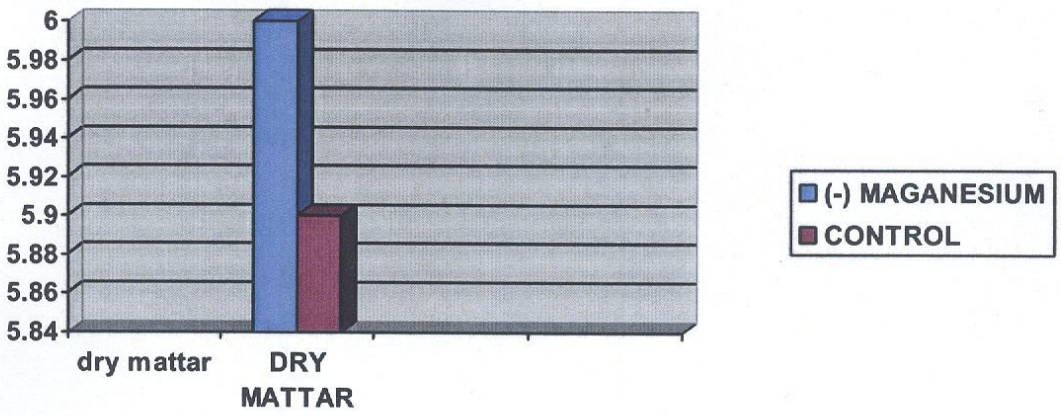
NO.OF Fruit of pepper in aqua culture

	YIELD Wt. fruit
(-) MAGANESIUM	2.5
CONTROL	4.7



Yield of pepper in water culture

	Fresh Wt	Dry Wt	Dry matter (gram)
(-) MAGANESIUM	7.3	1.3	6
CONTROL	7	1.1	5.9



Dry matter of pepper in water culture

%Yield = yield at level of nutrient / yield at obtained from nutrient addition * 100%

$$Y = 4.7 / 2.5 = 1.88$$

Conclusion :

At the end of the study we show that the plant show mg deficiency because we add all nutrients except mg so the leave show chloroses and small leave and retardant growth