



South - Eastern  
Mediterranean Sea  
P r o j e c t



# The impact of eutrophication on **HELIANTHUS ANNUUS**

# THE PURPOSES

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- ✘ Observing and understanding the connection between the development of a plant and the water that we will give to our plants each week;
- ✘ The investigation of reality using special tools and technique appropriate;
- ✘ Developing team spirit, cooperation relations and respect between team members.

# THE BEGINNING



We had been working on this project for two months. The main purpose of this activity was to observe and to understand the contact between the development of a plant and other factors.

We had four situations: one was a blank test, the second was influenced plants by eutrophication, the third category of plants were keep under biologically purified water and the last test was with plants sprayed with pesticides: R1, R2, R3, R4.



The plant of *Helianthus annuus* is cultivated all over the world, even in Romania which is on the first place in Europe at this category.

# THE PRE-EXPERIMENT

- ✘ Before we started the principal experiment, we had a pre-experiment which showed us the quality of the seeds and how to work with them;
- ✘ This pre-experiment it lasted until 19<sup>th</sup> february 2016.







19.02.2016

PERCENTAGE OF SEEDS THAT GERMINATED: 100%  
NUMBER OF PLANTS: 3 PER POT



**THE GERMINATION**

# DATE TABLE

Row 1 <b>blank test</b> <b>Helianthus annuus</b>		Row 2 <b>water with</b> <b>eutrophication</b> <b>Helianthus annuus</b>		Row 3 <b>biologically</b> <b>purified water</b> <b>Helianthus annuus</b>		Row4 <b>sprayed with</b> <b>pesticides</b> <b>Helianthus annuus</b>	
Germination: <b>19 .02.2016</b> Percentage of seeds that germinated: <b>100%</b> Number of plants: 3 per pot		Germination: <b>19.02.2016</b> Percentage of seeds that germinated: <b>100%</b> Number of plants: 3 per pot		Germination: <b>19.02.2016</b> Percentage of seeds that germinated: <b>100%</b> Number of plants: 3 per pot		Germination: <b>19.02.2016</b> Percentage of seeds that germinated: <b>100%</b> Number of plants: 3 per pot	
1 st Day <b>22.02.2016</b>		1 st Day <b>22.02.2016</b>		1 st Day <b>22.02.2016</b>		1 st Day <b>22.02.2016</b>	
Temperatur e of the room	<b>24°C</b>	Temperature of the room	<b>24°C</b>	Temperature of the room	<b>24°C</b>	Temperature of the room	<b>24°C</b>
Plant height: Pot1 - Pot7	Minimum height: <b>0.5 cm</b> Maximum height: <b>4 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>0,1 cm</b> Maximum height: <b>5 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>0.2 cm</b> Maximum height: <b>3.5 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>0.3 cm</b> Maximum height: <b>3 cm</b> :

In the first data (22.02.2016 at R3), the minimum plant high was 0.2 centimeters and the maximum 3.5, resulting an average plant high of 1.85 centimeters, and the amount of water being 142 milliliters.

	<b>Day 1</b> <b>Feb.19<sup>th</sup></b> F	<b>Day 4</b> <b>Feb.22<sup>nd</sup></b> M
<b>Amount of water added</b>	R1 70 ml R2 70 ml R3 70 ml R4 70 ml	R1 30 ml R2 30 ml R3 30 ml R4 30 ml



In the first days we added a small amount of water





UNESCO (SEMPEP) 2015-2016  
Tray 1  
Helianthus annuus  
R1  
TEAM 3

UNESCO (SEMPEP) 2015-2016  
Tray 1  
Helianthus annuus  
R2  
TEAM 3

UNESCO (SEMPEP) 2015-2016  
Tray 1  
Helianthus annuus  
R3  
TEAM 3

UNESCO (SEMPEP) 2015-2016  
Tray 1  
Helianthus annuus  
R4  
TEAM 3

# DATE TABLE

<b>Row1 blank test Helianthus annuus</b>	<b>Row2 water with eutrophication Helianthus annuus</b>	<b>Row3 biologically purified water Helianthus annuus</b>	<b>Row4 sprayed with pesticides Helianthus annuus</b>
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<b>01.03.2016</b>		<b>01.03.2016</b>		<b>01.03.2016</b>		<b>01.03.2016</b>	
Temperature of the room		Temperature of the room		Temperature of the room		Temperature of the room	
Plant height: Pot1 - Pot7	Minimum height: <b>4 cm</b> Maximum height: <b>13 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>5 cm</b> Maximum height: <b>14 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>4 cm</b> Maximum height: <b>14 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>7 cm</b> Maximum height: <b>14 cm</b>

1.03.2016 - the amount of water is 399 milliliters, the minimum plant high is 4 centimeters and the maximum 14, with the average of 9, so a growth of 5.5 centimeters from the previous measurements.

# DATE TABLE

<b>Row1 blank test Helianthus annuus</b>	<b>Row2 water with eutrophication Helianthus annuus</b>	<b>Row3 biologically purified water Helianthus annuus</b>	<b>Row4 sprayed with pesticides Helianthus annuus</b>
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<b>8.03.2016</b>		<b>8.03.2016</b>		<b>8.03.2016</b>		<b>8.03.2016</b>	
Temperature of the room	<b>23°C</b>	Temperature of the room	<b>23°C</b>	Temperature of the room	<b>23°C</b>	Temperature of the room	<b>23°C</b>
Plant height: Pot1 - Pot7	Minimum height: <b>6 cm</b> Maximum height: <b>19 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>7 cm</b> Maximum height: <b>18 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>5 cm</b> Maximum height: <b>19 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>8 cm</b> Maximum height: <b>20 cm</b>

8.03.2016 - we drastically drop the amount of water to 70 milliliters, the average being 12 centimeters, so the growth was only 3 centimeters. From these facts, we can conclude that the amount of water per week heavily influences the growth of the plants.







# DATE TABLE

<b>Row1</b>	<b>blank test</b>	<b>Row2</b>	<b>water with</b>	<b>Row3</b>	<b>biologically</b>	<b>Row4</b>	<b>sprayed</b>
<b>Helianthus annuus</b>		<b>eutrophication</b>		<b>purified water</b>		<b>with pesticides</b>	
		<b>Helianthus annuus</b>		<b>Helianthus annuus</b>		<b>Helianthus annuus</b>	

<b>23.03.2016</b>		<b>23.03.2016</b>		<b>23.03.2016</b>		<b>23.03.2016</b>	
Temperature of the room		Temperature of the room		Temperature of the room		Temperature of the room	
Plant height: Pot1 - Pot7	Minimum height: <b>12 cm</b> Maximum height: <b>31 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>9.5 cm</b> Maximum height: <b>29 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>13 cm</b> Maximum height: <b>26,6 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>14 cm</b> Maximum height: <b>28.7 cm</b>
<b>30.03.2016</b>		<b>30.03.2016</b>		<b>30.03.2016</b>		<b>30.03.2016</b>	
Temperature of the room	<b>26°C</b>	Temperature of the room	<b>26°C</b>	Temperature of the room	<b>26°C</b>	Temperature of the room	<b>26°C</b>
Plant height: Pot1 - Pot7	Minimum height: <b>11 cm</b> Maximum height: <b>37.5 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>16 cm</b> Maximum height: <b>35,6cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>18 cm</b> Maximum height: <b>33,5 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>14,5 cm</b> Maximum height: <b>35,5 cm</b>

In the week with the biggest amount of water (23.03.2016), also has the biggest growth registered, respectively of 7.8 centimeters with an average of 39.6 centimeters.



The room thermometer was an important tool in our project.



Every week we visited the plants for measurements.



<b>Row 1 blank test Helianthus annuus</b>	<b>Row 2 water with eutrophication Helianthus annuus</b>	<b>Row 3 biologically purified water Helianthus annuus</b>	<b>Row 4 sprayed with pesticides Helianthus annuus</b>
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<b>6.04.2016</b>		<b>6.04.2016</b>		<b>6.04.2016</b>		<b>6.04.2016</b>	
Temperature of the room	<b>25°C</b>	Temperature of the room	<b>25°C</b>	Temperature of the room	<b>25°C</b>	Temperature of the room	<b>25°C</b>
Plant height: Pot1 - Pot7	Minimum height: <b>15,4cm</b> Maximum height: <b>41,5 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>21cm</b> Maximum height: <b>44 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>20 cm</b> Maximum height: <b>40 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>19,2 cm</b> Maximum height: <b>37 cm</b>
<b>13.04.2016</b>		<b>13.04.2016</b>		<b>13.04.2016</b>		<b>13.04.2016</b>	
Temperature of the room	<b>24°C</b>	Temperature of the room	<b>24°C</b>	Temperature of the room	<b>24°C</b>	Temperature of the room	<b>24°C</b>
Plant height: Pot1 - Pot7	Minimum height: <b>27 cm</b> Maximum height: <b>48,6 cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>23,2 cm</b> Maximum height: <b>50,2cm</b>	Plant height: Pot1 - Pot7	Minimum height: <b>22,5 cm</b> Maximum height: <b>44 cm</b>	Plant height: Pot1 - Pot7	Minimum height: Maximum height: <b>43 cm</b>

The last measurements showed that the plants sprayed with pesticides barely survived and R2 had the highest plant.

The eutrophical water changed a little bit the evolution of the plants as they grow faster after a week with a low quantity of this kind of water.







We stopped at 13<sup>th</sup> april 2016 and the last amounts of water were added at 11<sup>th</sup> april 2016.

**Q: How was the temperature during the experiment?**

A: The temperature varied between 23 and 26 degrees Celsius.

**Q: Has water with pesticides led to rapid growth of plants?**

A: We can observe a fast growing, at least 1 cm per week. So, pesticides and water have influenced height.

**Q: How has water influenced the process of plant growth?**

A: Plants were given the amount of water needed for their progressive and noticeable evolution in a short time.

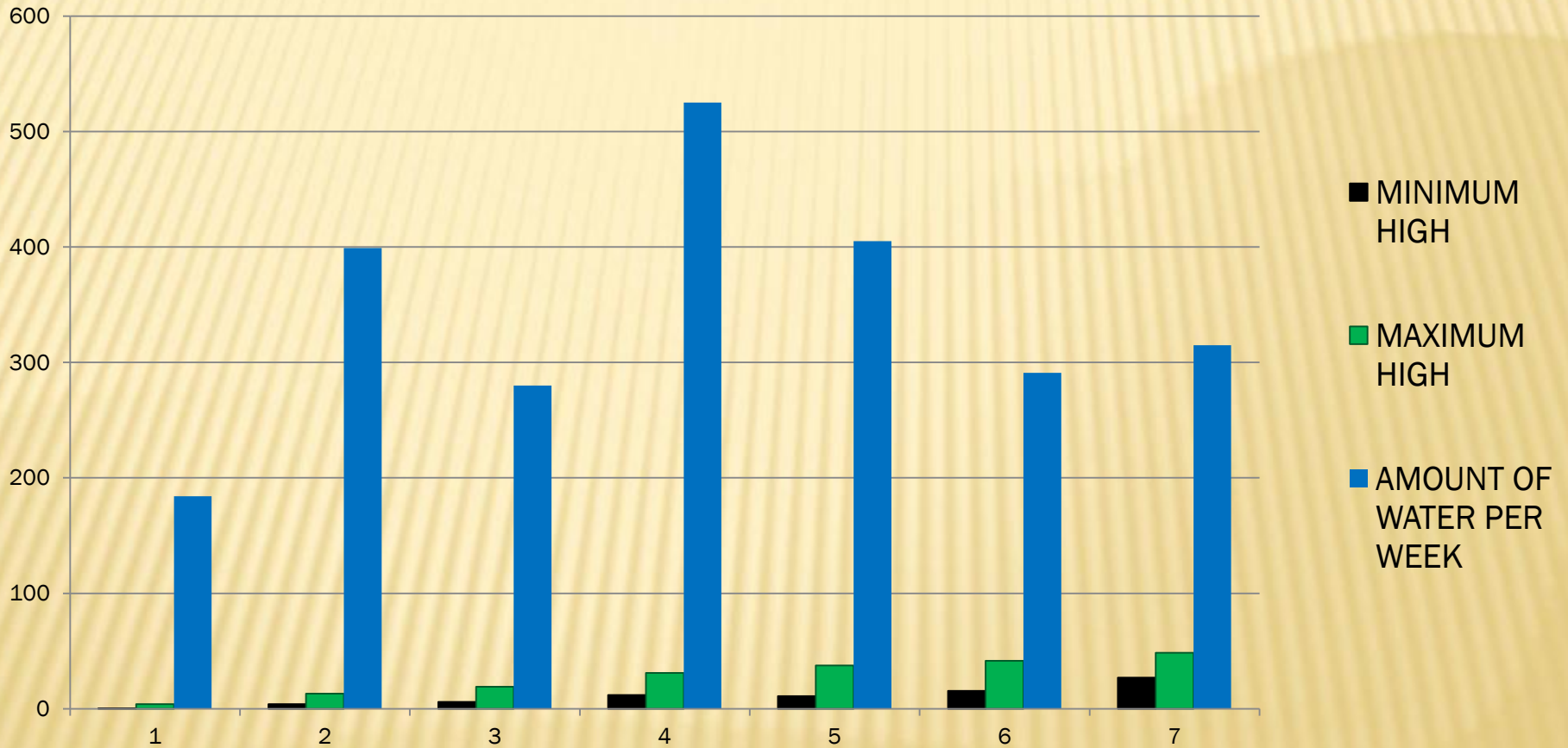
# GRAPHIC REPRESENTATIONS



The graphics contain information regarding the plant's high, the temperature of the room and the amount of water introduced in the soil per week (biologically purified), during the practical part of the project, which lasts for three months (February, March, April). From these data we can conclude things about the influence of external factors in the development of the plants.

# Helianthus annuus

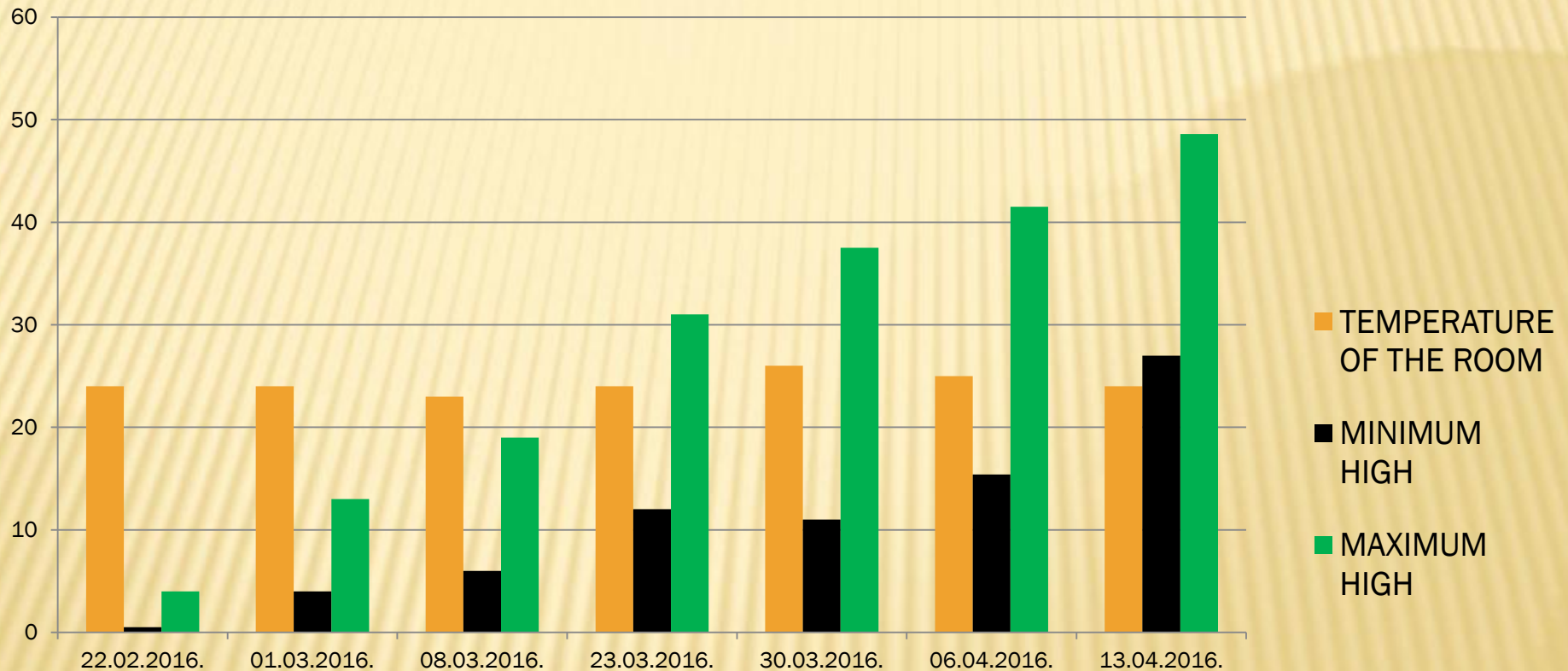
(Row 1 - **Blank test** )



This is the graphic between the minimum high, the maximum high and the amount of water per week.

# Helianthus annuus

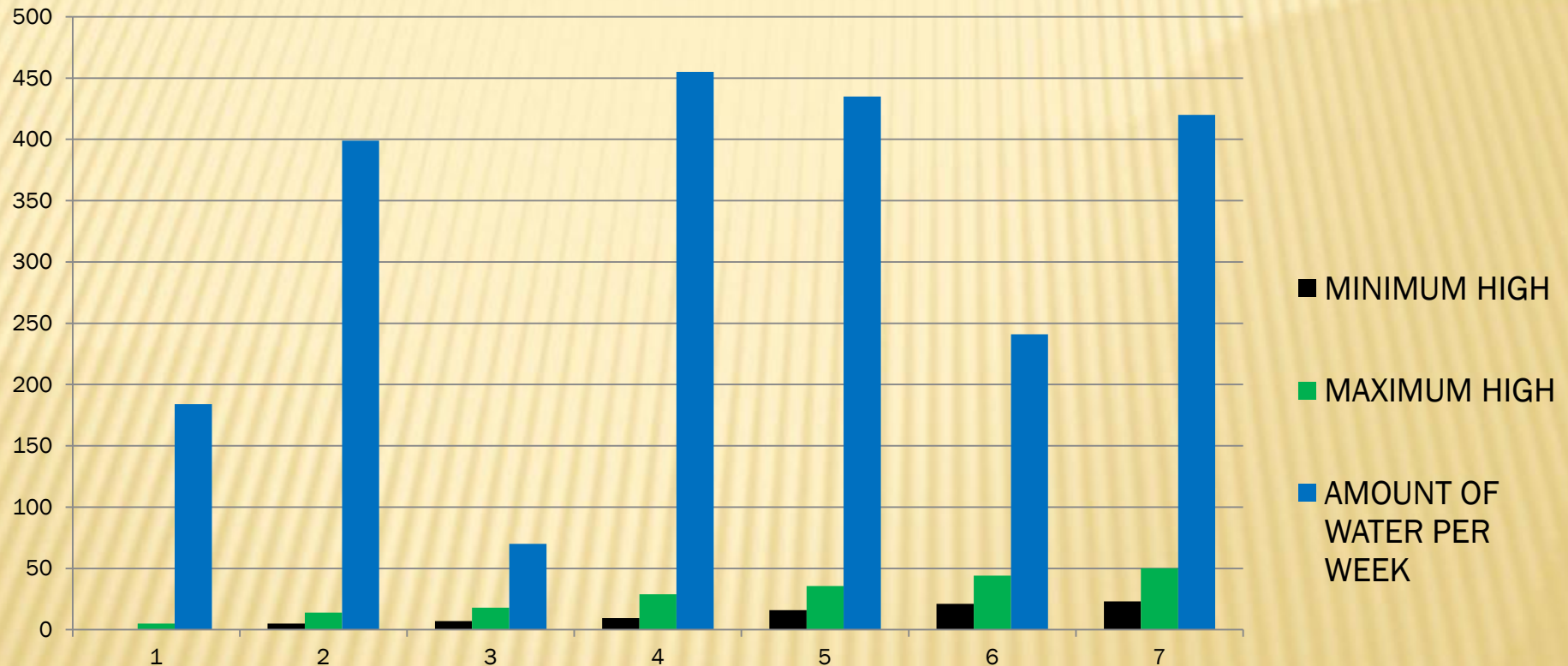
(Row 1 - **Blank test** )



First of all, the average temperature of the room where the plants grown was 25 degrees Celsius, so we can't correlate it with a change in the rhythm of plant's growing.

# Helianthus annuus

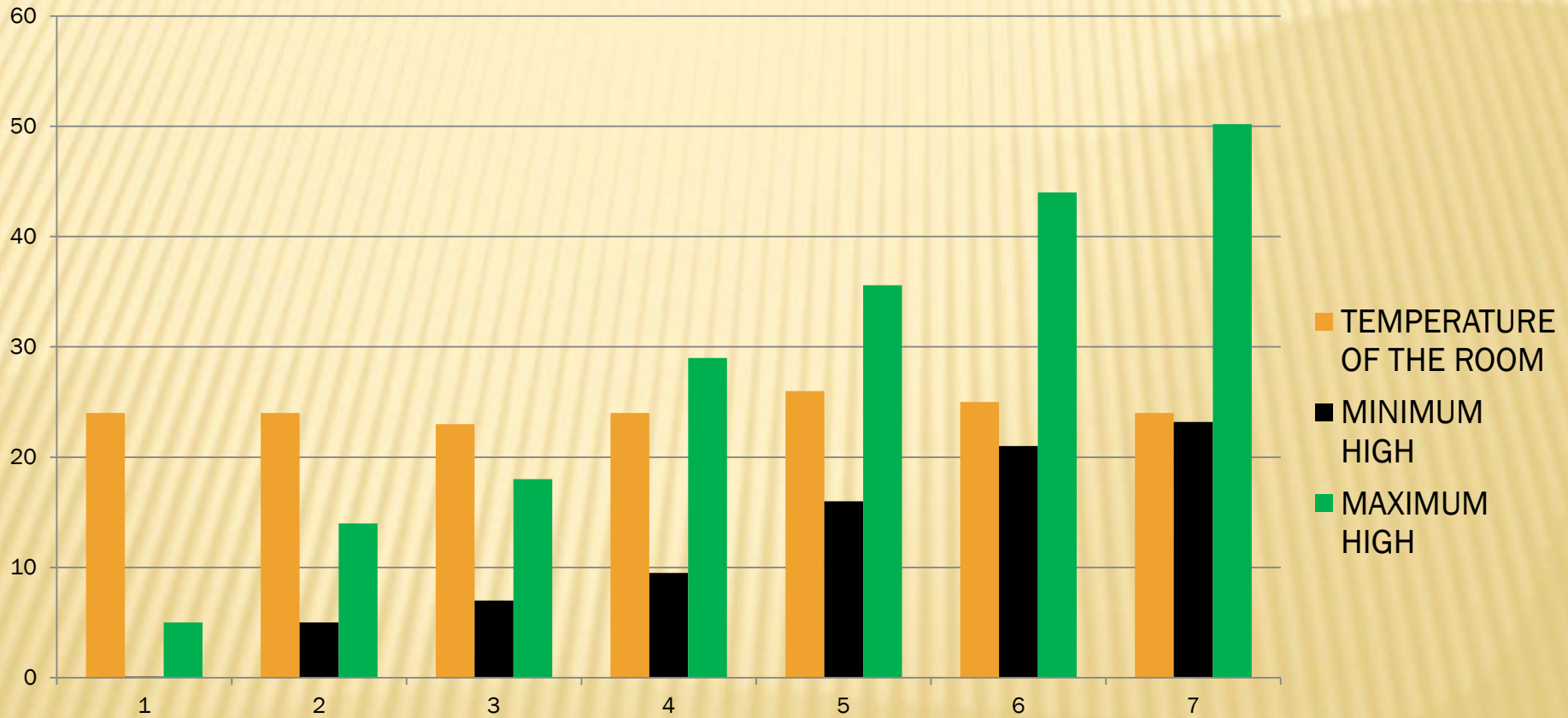
(Row 2 - **water with eutrophication**)



The second test is with plants influenced by eutrophication

# Helianthus annuus

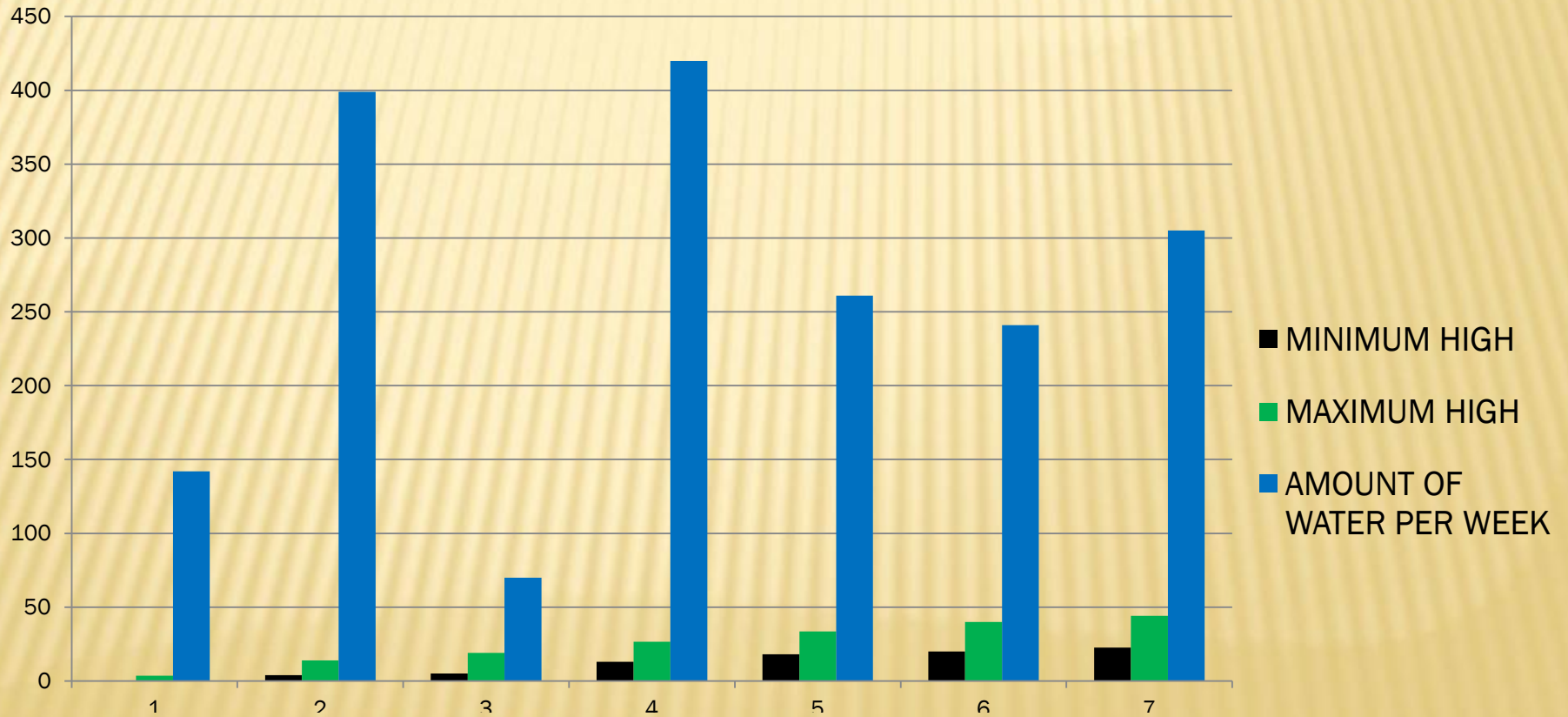
(Row 2 - **water with eutrophication**)





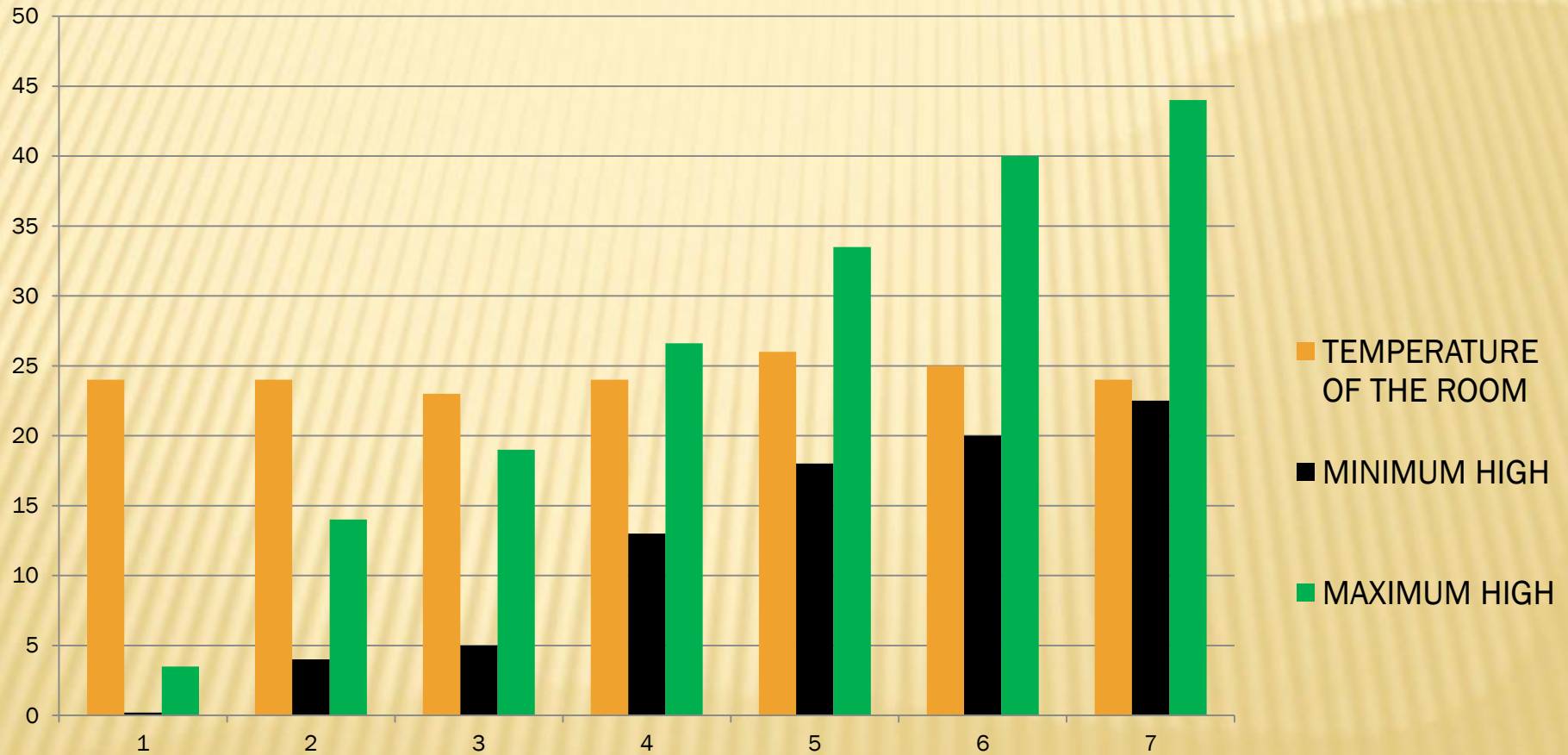
# Helianthus annuus

(Row 3 - **biologically purified water**)



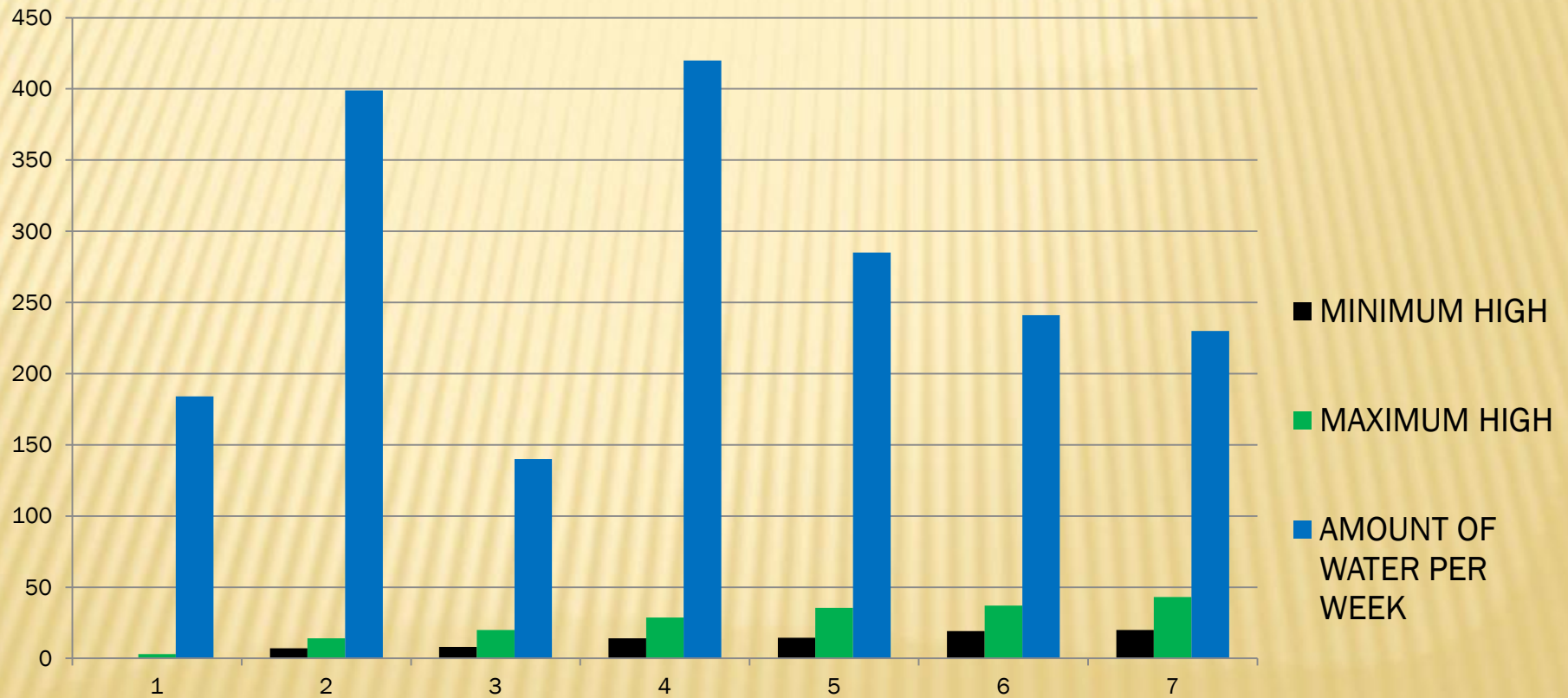
# Helianthus annuus

(Row 3 - **biologically purified water**)



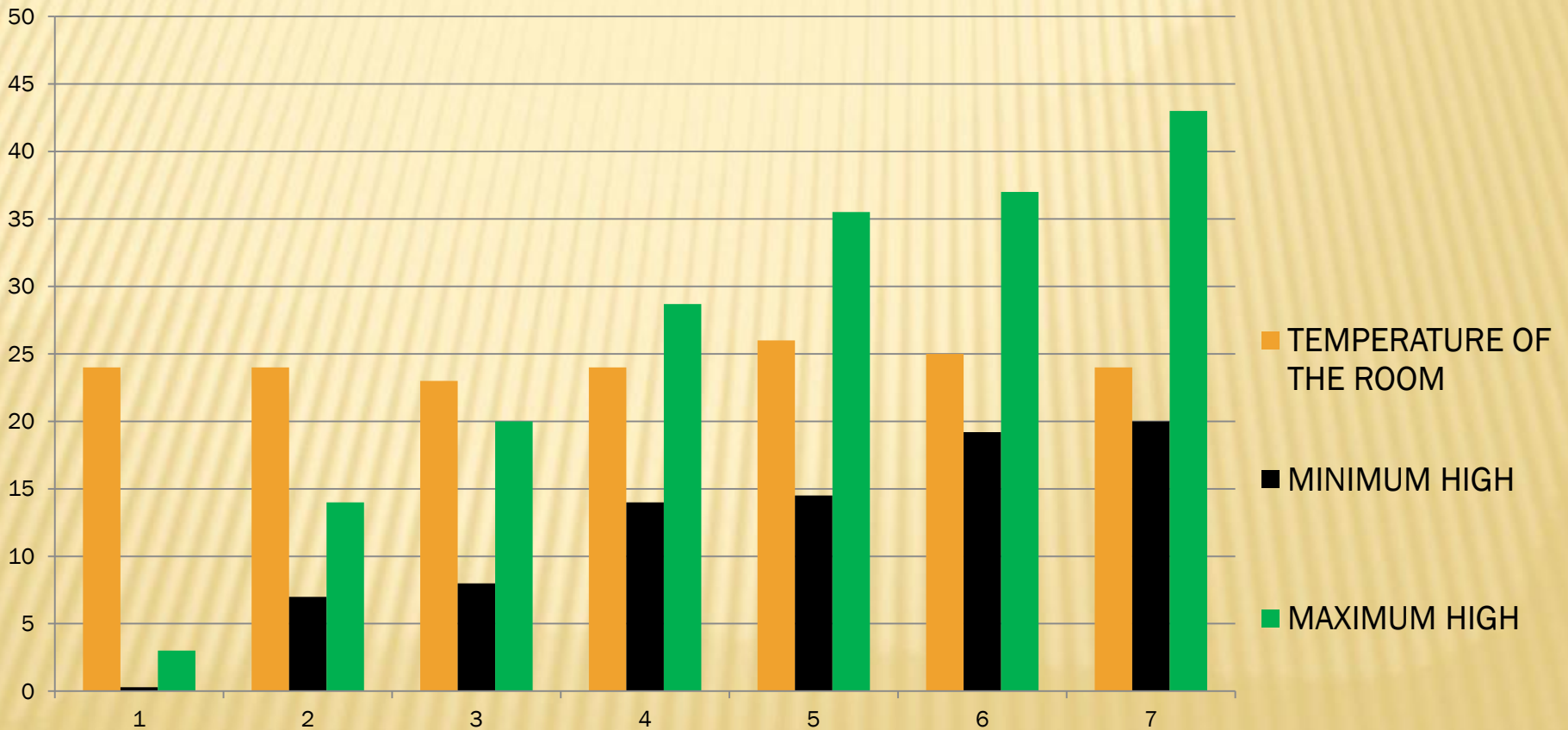
# Helianthus annuus

(Row 4 - **sprayed with pesticides**)



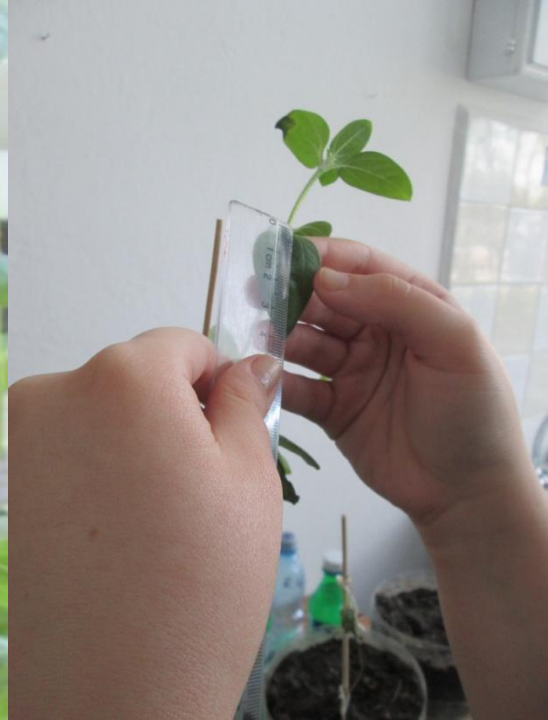
# Helianthus annuus

(Row 4 - **sprayed with pesticides**)



# LEAF SIZE





# CONCLUSION

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- ✘ The living conditions of a plant are very important in their development.
- ✘ After the first days is observed that the plants under the blank test have increased most rapidly.
- ✘ In the end, the plants sprayed with pesticides have developed least and the plants influenced by eutrophication had the highest plants.

**THANK YOU FOR YOUR ATTENTION!**

**PRESENTATION MADE BY**

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