



The effects of rusty water on bougainvillea



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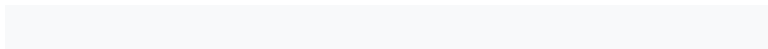
summary

This research aims to study the effect of rusty water on the bougainvillea and how to solve this problem?. The importance of this research is to know the effect of irrigating the bougainvillea with rusty water, its treatment and what factors lead to rust in water? We did an experiment on the bougainvillea and watered it with rusty water for a full four months, we wrote all the changes that happen by biological and non-biological factors. It was concluded that as we multiply the amount of rusty water in irrigating the bougainvillea, the more likely it will die. After the experiment ended, we found out that rusty water may cause wilt or spots on leaves. These spots usually develop when there is an excessive amount of moisture on the leaves of bougainvillea for a long period of time. The acidity and alkalinity of soil and water affected the bougainvillea growth.experts recommend checking the iron water pipes, cleaning them every six months, and irrigating the plants with pure water suitable for cultivation so that it does not affect them.

key words: plant, stains, water, rust, leaves

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Research questions

I noticed in my garden some of my favorite plant leaves that had yellow spots, so I asked the house guard about why the leaves had that yellow spots on it. But he didn't know the reason and then he remembered that he was watering the plant with rusty water. so I wanted to do an experiment to make sure the cause of these spots.

- What is the cause of the spots that showed on the bougainvillea?
- What are the effects that might happen to the bougainvillea if it was irrigated with rusty water?
- Is there a relationship between water pollution and plant wilt?
- What is the difference between irrigating a plant with rusty water or pure water?

Introduction

Plants are among the organisms on Earth that humans and animals feed on. And plants have many benefits; they regenerate the oxygen in the air and take carbon dioxide gas. The negative factors that affect plants are low rainfall, dry soil, overwatering and not using the sunshine. One of the things that cause plant wilt is to irrigate it with rust-contaminated water. (1)

Bougainvillea is a climbing plant with strong thorns, and it has several colors and may climb more than 10 meters when the appropriate support is available, as it grows at rapid rates and can stand sun and wind. And the good growth of the bougainvillea depends on the care and on the hanger it climbs on. When appropriate factors are available, the plant is evergreen. (2)

The problem of spots in the leaves of the plant is a common problem facing many people and ruin the aesthetic appearance of the plant, and this problem may be due to a lack of a nutrient component in the plant.(3)

The Steps of the experiment

Materials: bougainvillea - soil - rusty water - plants pot - a notebook to notes

Steps:

- 1 - Placing bougainvillea plant in an environment that helps them grows naturally.**
- 2- Providing enough polluted water to irrigate the bougainvillea for a period of four months.**
- 3- Clean the pot and put the soil in it.**
- 4- Take notes throughout the period of watering the bougainvillea with polluted water.**
- 5- Analysis of charts and tables taken from Globe schools.**

Results

An interview was prepared with Dr. Fahd bin Nasser Al-Kakek, head of the Department of Agricultural Engineering, King Faisal University, Al-Ahsa.

Q/What is the cause of the spots that showed on the bougainvillea?

C/ It could be mechanical burns due to the high acidity in the water, and these burns may occur from the exposure of the plant to external spraying with water or other material that caused the burns.

Q/What are the effects that can happen to the bougainvillea if it was irrigated with rusty water?

C/ If the concentration was light and watering the plant in intersecting periods, there is no harm, but if the concentration was high and watering the plant was daily it may cause plant wilt or a lack of some elements in the plant, which leads to the appearance of spots.

Q/ is there a relationship between water pollution and plant wilt?

C/ Of course, but the pollutants are many and the plant must be examined by an expert and know what is the main cause of the pollution.

Q/ what is the difference between watering a plant with rusty water or pure water?

C/ Maybe the rusty water is better, but not always, because it can cause a lack of nutrients. As for the pure water, there is no harm in watering the plant with it daily.

Notes:

First month: nothing happened

Second month: some of the bougainvillea leaves started to fall off.

Third month: spots on the leaves

Fourth month: brown spots appeared on the surface of the bougainvillea.

Protocols	Class/Grade
Acidity of water	9.1
Soil acidity	9.1
Alkaline water	POSITIVE
Alkaline soil	POSITIVE

Analysis and discussion

÷ The equation: Iron rust + Acidity of water 10m

Iron home tube	$1.7 + 9.1 \div 10 = 2.61\text{m}$
Iron school tube	$2.9 + 6.1 \div 10 = 3.51\text{m}$
Sprinkle plants in public parks	$10 + 7 \div 10 = 10.7\text{m}$
Iron shower sprinkler	$5.5 + 9.9 \div 10 = 6.49\text{m}$

The table above showing the average climbing of the bougainvillea and how rust affects it.

It was concluded that the higher the rate of rust in the water that irrigates bougainvillea, the less growth of it.

One of the improvements that can be added to this scientific research the effect of rusty water on other types of plants, and study the research on a wide scale in different regions.

Conclusions

It was concluded that one of the reasons of the spots that appeared on the leaves is high acidity in the water, which may cause mechanical burns and these burns may occur due to the exposure of the plant to external spraying with polluted water or other harmful substances.

If the plant is watered with rusty water for intersecting periods, then there is no harm, but if the concentration is high and the plants are irrigated with it daily, it can cause its wilt or a lack of some elements in the plant, which may lead to yellow spots on the leaves.

The spots may be due to an external substance, but there are many pollutants, and the plants must be examined by an expert in this field and know what is the main cause of the spots in the leaves of the plant.

Irrigating the plant with rust water is better for the plant, but not always because it can cause a deficiency in some of the nutrients that the plant needs. As for the pure water, there is no problem watering the plants with it daily, and the main cause of these spots is the relative humidity or water droplets that did not dry out on Leaves.

Thanks and appreciation

praise be to God, Lord of the worlds, and prayers and peace be upon the Messenger of God, our master Muhammad, and on his family and companions as well.

I thank God, then thank my parents, who encouraged me to write this research to the fullest, and for the advice and ideas that they gave me.

And I thank all those who supervised this research and helped in its completion and gave a lot of useful information in writing it, and we express our gratitude to every teacher who contributed to his success, especially the teacher: Manal Siddiq Aqil.

We offer special thanks to Dr. Fahd bin Nasser Al-Kakek, head of the Agricultural Engineering Department at King Faisal University in Al-Ahsa, for answering the questions we asked him and the useful information he gave us, and we thank Dr. Mona Al-Hassani and Dr. Reem Al-Hassani for the tips that helped us finish this research.

References

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2	Riyadh Plants Guide book for Prince Turki bin Abdullah bin Abdulaziz http://riyadh.sa/ar/city/i/publications/item/li/city/1352
3	An article by Professor Karen Anderson at Simons University https://homeguides.sfgate.com
4	An article for agricultural engineer Mohamed Haider https://www.al-hakem.com
5	Summary of Dr. Rajaa bin Ghazi Abdul Mohsen http://elearning.uokerbala.edu.iq



The Globe Students Research Report:

Title page	<p>The effects of rusty water on bougainvillea</p> <p>Student's names: Haneen Al-dean Bali Jana Osama Emam</p> <p>Supervisor of scientific research: Manal ageel 1441 – 2020</p>
Abstract	<p>This research aims to study the effect of rusty water on the bougainvillea and how to solve this problem?. The importance of this research is to know the effect of irrigating the bougainvillea with rusty water, its treatment and what factors lead to rust in water? We did an experiment on the bougainvillea and watered it with rusty water for a full four months, we wrote all the changes that happen by biological and non-biological factors. It was concluded that as we multiply the amount of rusty water in irrigating the bougainvillea, the more likely it will die. After the experiment ended, we found out that rusty water may cause wilt or spots on leaves. These spots usually develop when there is an excessive amount of moisture on the leaves of bougainvillea for a long period of time. The acidity and alkalinity of soil and water affected the bougainvillea growth.experts recommend checking the iron water pipes, cleaning</p>

	<p>them every six months, and irrigating the plants with pure water suitable for cultivation so that it does not affect them.</p> <p>key words: plant, stains, water, rust, leaves</p>
<p>Research questions and hypotheses</p>	<p>I noticed in my garden some of my favorite plant leaves that had brown spots, so I asked the house guard about why the leaves had that brown spots on it. But he didn't know the reason and then he remembered that he was watering the plant with rusty water.so I wanted to do an experiment to make sure cause of these spots.</p> <ul style="list-style-type: none"> - - What is the cause of the spots that showed on the bougainvillea? - - What are the effects that might happen to the bougainvillea if it was irrigated with rusty water? - - Is there a relationship between water pollution and plant wilt? - - What is the difference between irrigating a plant with rusty water or pure water?

Materials and method	<p>Materials: bougainvillea - soil - rusty water - plants pot - a notebook to notes</p> <p>Steps:</p> <ol style="list-style-type: none"> 1 - Placing bougainvillea plants in an environment that helps them grow naturally 2- Providing enough polluted water to irrigate the bougainvillea for a period of four months 3- Clean the pot and put the soil in it 4- Take notes throughout the period of watering the bougainvillea with polluted water 5- Analysis of charts and tables taken from Globes school
Data extractor	<p>An interview was prepared with Dr. Fahd bin Nasser Al-Kakek, head of the Department of Agricultural Engineering, King Faisal University, Al-Ahsa.</p> <p>Q/What is the cause of the spots that showed on the bougainvillea?</p> <p>C/ It could be mechanical burns due to the high acidity in the water, and these burns may occur from the exposure of the plant to external spraying with water or other material that caused the burns.</p> <p>Q/What are the effects that can happen to the bougainvillea if it was irrigated with rusty water?</p> <p>C/ If the concentration is light and watering the plant in intersecting periods, there is no harm, but if the concentration is high and watering the plant was daily it may cause plant wilt or a lack of some elements in the plant, which leads to the appearance of spots.</p>

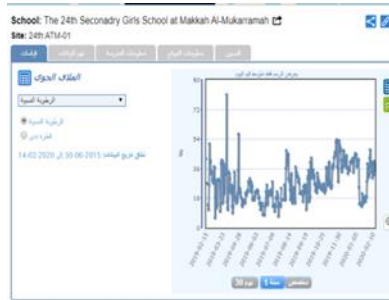
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C/ Of course, but the pollutants are many and the plant must be examined by an expert and know what is the main cause of pollution.

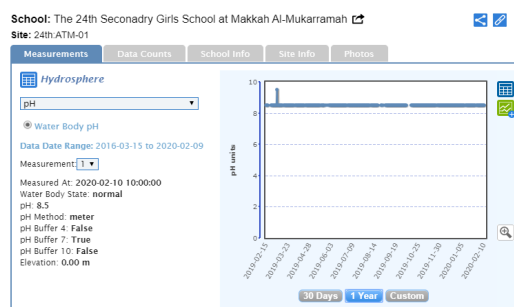
Q/ what is the difference between watering a plant with rusty water or pure water?

C/ Maybe the rusty water better, but not always, because it can cause a lack of nutrients. As for the pure water, there is no harm in watering the plant daily.

Protocols	Class/Grade
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A graph showing the relative humidity (1/10/2019 - 31/1/2020) From Globe Secondary School 24 in Makah.



Another graph showing the acidity percentage



after 3 months of the experiment The bougainvillea Leaves before the experiment



The bougainvillea leaves
Leaves before the experiment

Analysis and discussion

The equation: Iron rust + Acidity of water \div 10m

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Conclusions	<p>It was concluded that one of the reasons of the spots that appeared on the leaves is high acidity in the water, which may cause mechanical burns and these burns may occur due to the exposure of the plant to external spraying with polluted water or other harmful substances.</p> <p>If the plant is watered with rusty water for intersecting periods, then there is no harm, but if the concentration is high and the plants are irrigated with it daily, it can cause its wilt or a lack of some elements in the plant, which may lead to yellow spots on the leaves.</p> <p>The spots may be due to an external substance, but there are many pollutants, and the plants must be examined by an expert in this field and know what is the main cause of the spots in the leaves of the plant.</p> <p>Irrigating the plant with rust water is better for the plant, but not always because it can cause a deficiency in some of the nutrients that the plant needs. As for the pure water, there is no problem watering the plants with it daily, and the main cause of these spots is the relative humidity or water droplets that did not dry out on Leaves.</p>
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<p>Thanks and appreciation</p>	<p>praise be to God, Lord of the worlds, and prayers and peace be upon the Messenger of God, our master Muhammad, and on his family and companions as well.</p> <p>I thank God, then thank my parents, who encouraged me to write this research to the fullest, and for the advice and ideas that they gave me.</p> <p>And I thank all those who supervised this research and helped in its completion and gave a lot of useful information in writing it, and we express our gratitude to every teacher who contributed to his success, especially the teacher: Manal Siddiq Aqil.</p> <p>We offer special thanks to Dr. Fahd bin Nasser Al-Kakek, head of the Agricultural Engineering Department at King Faisal University in Al-Ahsa, for answering the questions we asked him and the useful information he gave us, and we thank Dr. Mona Al-Hassani and Dr. Reem Al-Hassani for the tips that helped us finish this research.</p>
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3	An article by Professor Karen Anderson at Simons University https://homeguides.sfgate.com
4	An article for agricultural engineer Mohamed Haider https://www.al-hakem.com
5	Summary of Dr. Rajaa bin Ghazi Abdul Mohsen http://elearning.uokerbala.edu.iq