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Response Of Mung Bean (*Vigna Radiata L.*) To Two Types Of Irrigation Water And Foliar Application Of Ascorbic Acid And Phosphorus

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Abstract
Finding Out How The Mung Bean (Vigna Radiata L.) Reacted To Various Irrigation Water Types (Graywater And Tap) And Foliar Sprays Containing Varying Amounts Of Phosphorus (0, 2, And 4 G) And Ascorbic Acid (0, 50, And 100 Mg) Was The Aim Of This Study. L^{-1}, And How They Affect Some Of Its Morphological Or Physiological Characteristics. Seeds Were Planted In Containers That Could Hold 10 Kg Of Soil Using Three Separate Replicates Of A Complete Block Design With Randomisation (RCBD). Twice As Much Water Was Sprayed On The Plants: Once After 30 Days Of Growth And Again After 30 Days.The Results Showed That While Greywater Irrigation Increased The Protein Content Of The Vegetative Plant (15.94%), The 100-Seed Weight (3.64 G) Was Significantly Impacted By Tap Water Irrigation. The Number Of Branches Per Plant Rose To 6.54 When Leaves Were Treated With Ascorbic Acid At A Dosage Of 100 Mg L^{-1}. A 4 G. L^{-1} Phosphorus Spray Raised The Weight Of The Vegetative Development And The Yield Of Biological Material, Whereas A 2 G. L^{-1} Phosphorus Concentration Increased The 100-Seed Weight (3.37 G)., With Values Of 7.89, 3.38, And 4.98 G. Plant^{-1}, Respectively.The Number Of Branches Increased When Irrigation With Tap Water And The Addition Of 100 Mg L-1 Of Ascorbic Acid Were Combined. The Dry Weight Of The Vegetative Growth, The Protein Content Of The Vegetative Growth, And The Biological Yield All Increased With The Irrigation Of Greywater That Lacked Ascorbic Acid. The Combination Of Greywater Irrigation And Phosphorus Application Produced The Greatest Amount Of Vegetative Growth, Protein, And Biological Value. When 50 Mg Of Ascorbic Acid Were Sprayed As A Single Dose And 2 G Of Phosphorus Were Added To The Same Dose Of Ascorbic Acid, The Fresh And Dry Development Of Vegetative Plants Gained A Substantial Amount Of Weight. Tap Water With A Concentration Of 100 Mg L^{-1} Ascorbic Acid And 2 G L^{-1} Phosphorus Was Used In The Three-Way Exchange To Produce The Most Fresh Vegetation, The Most Branches, And The Weight Of 100 Seeds. Conversely, The Greatest Protein Content In Vegetative Growth And Biological Production Was Achieved With Water That Was Grey In Color And Had A Concentration Of 4 G. L^{-1} Phosphorus, But It Lacked The Chemical Component Of Ascorbic Acid. The Results Suggest The Potential For Increased Growth And Production Of Mung Beans In Specific Conditions When Applied To The Plants.
Keywords: *Mung Bean, Greywater, Biological Yield, Phosphorus, Ascorbic Acid.*

1. INTRODUCTION

Water Is A Limited Resource, And Ensuring Its Sustainability In The Face Of Climate Change Is A Significant Challenge On A Global Scale (Rosińska Et Al., 2024). Water Deficiency Poses Significant Dangers To Human, Social, And Economic Development, As Well As The Maintenance Of Urban Habitats, As Noted By The United Nations Children's Fund (UNICEF, 2023). The Longstanding Drought In Iraq That Has Occurred In Recent Years Has Led To Increased Government Concern And Local Authorities' Dedication To Developing Policies And Practical Strategies For Water Conservation And Recycling (Al- Ansari Et Al., 2018). In This Regard, The Reutilisation Of Greywater For Irrigation Is Considered To Be Beneficial Because It Lessens The Stress On Freshwater Resources, A Practice That Is Increasing In Popularity In Both Developed And Developing Countries To Alleviate The Water Scarcity Problem (Burton Et Al., 2023). Because It Promotes The Conservation Of Finite Freshwater Resources, Reduces Pollution, And Diminishes The Expense Of Agricultural Inputs, Greywater Recycling Is Of Paramount Importance To The Sustainable Management Of Water Resources, Especially In

Countries That Have A Dry Climate And Are Located In The Northern Hemisphere (Al-Hamaiedeh And Bino, 2010). The Reuse Of Greywater Is A Promising Approach To Addressing Sustainable Water Management, As Evidenced By The 20-Year Study Of The Potential Energy, Economic, And Environmental Benefits Of This Approach As A Secondary Source Of Water (Boano Et Al., 2020).One Of The Most Important Legume Crops, The Mung Bean (Vigna Radiata L), Is Part Of The Fabaceae Family And Is Cultivated In Tropical And Sub Tropical Areas Across The Globe (Ademe, 2023). India Is The Place Where The Mung Bean's Birth Occurs (Vigna Radiata Var. Radiata) (Baza Et Al., 2022; Adem, 2023). It's Typically Cultivated For Human Consumption And Animal Feed, It's Also Occasionally Used As A Green Manure That Increases The Moisture Content And Organic Content Of Soil While Also Enhancing The Nutrient Value Of Agricultural Soil (Nair And Schreinemachers, 2020). Other Than Vitamins And Minerals Like Calcium And Phosphorus, The Seeds Of Mung Beans Are Said To Have A Protein Composition Of Around 26%, Carbs Of Around 62%, And Fibers Of Around 1.4% (Baza Et Al., 2022).Many Different Substances Can Be Employed As Fertilizers Or Regulators Of Growth To Increase The Productivity Of Mung Beans. Studies Have Demonstrated That Ascorbic Acid Treatment Increased Yields, Growth, And Chemical Components In Multiple Species Of Plants, Including Lupine And Peas (El-Kobisy Et Al., 2005). Through Spraying Or Foliar Feeding, It's Possible To Add Nutrients To The Soil In The Same Way, The Significance Of The Addition Is The Same, And The Cost Is Effective. Phosphorus Is Crucial To The Metabolism Of Plants.)Abdullah, 2022) Is A Member Of The Nucleic Acid Family, The Phospholipid Family, And The NADPH Family. He Is Also A Part Of The Triphosphate Family Of Compounds. Many Aspects Of Plant Development, Productivity, Signal Transmission, And Photosynthesis Are Dependent On These Substances (Lu Et Al., 2023).In Order To Evaluate The Physiological And Morphological Impacts Of Phosphorus And Ascorbic Acid Application On The Growth And Development Of Mung Bean Plants That Were Watered With Tap Water And Greywater, This Study Was Conducted.

2. MATERIALS AND METHODS

2.1. Experimental Site And Soil Analysis: This Investigation Was Carried Out In The Labs Of The University Of Kirkuk's College Of Education For Pure Sciences. At The Summer Growing Season Of 2024, It Conducted Its Agricultural Experiment At The College's Lath House. Prior To Starting The Experiment, A Composite Soil Sample Was Collected From The Pots Utilised, And Its Physical And Chemical Characteristics Were Assessed In The Kirkuk Directorate Of Agriculture's Laboratories (Table 2-1).

Table 1: Some Physical And Chemical Properties Of The Experimental Soil Before Sowing:

Parameter	Standard Unit	The Result
EC	$Ms.Cm^{-1}$	1.029
PH		7.391
TDS	$Mg.Kg^{-1}$	658.944
Total Nitrogen	$Mg.Kg^{-1}$	980.700
Available Phosphor	$Mg.Kg^{-1}$	2.296
Available Potassium	$Mg.Kg^{-1}$	173.841
Soil Texture		Sandy Loam
Clay	%	4
Silt	%	44
Sand	%	52

2.2. Irrigation Water Sources And Analysis: Two Types Of Irrigation Water Were Used In The Experiment:

1. **Tap Water:** Obtained From The Water Supply Network Of The College Of Education For Pure Sciences, University Of Kirkuk, And Used As The Control Treatment For Irrigation.
2. **Greywater:** Collected Periodically From Domestic Hand-Washing Sinks And Bathtubs, Ensuring Exclusion Of Water Contaminated With Kitchen Waste Or Blackwater (Toilet Wastewater). Before Its Use For Plant Irrigation, The Collected Greywater Was Diluted With Tap Water At A 1:1 (V/V) Ratio To Achieve A 50% Reduction In Its Original Concentration. After Collection, The Greywater Was Allowed To Settle For 24 Hours, Then The Supernatant Was Decanted And Diluted. Samples Of Both Tap Water And Greywater (After Dilution And Before Direct Use) Were Analyzed In The Laboratories Of The Kirkuk Directorate Of Agriculture To Determine Some Of Their Chemical Properties (Table 2-2).

Table 2-2: Some Chemical Properties Of The Two Types Of Irrigation Water Used In The Experiment:

Parameter	Standard Unit	Tap Water (Sample 1)	Grey Water Diluted 50% (Sample 2)
EC	Mmho.Cm^{-1}	0.298	0.619
PH		8.34	7.10
TDS	Ml/L	191.161	396.211
Nitrogen	Ml/L	0.200	2.200
Phosphorus	Ml/L	0.019	0.615
Potassium	Ml/L	2.649	22.516
Sodium	Ml/L	1.075	46.592
Chloride	Ml/L	5.680	51.120
Sulfate	Ml/L	23.184	89.355
Calcium	Ml/L	50.100	62.124
Magnesium	Ml/L	15.808	13.376
Total Alkalinity	Ml/L	134	228

2.3. Experimental Design And Agronomic Treatments: The Purpose Of This Study Was To Assess The Effects Of Applying Ascorbic Acid (Reagent World, Purity 99.0%-100.5%) Topically At Concentrations Of 0, 50, And 100 Mg, As Well As Two Different Types Of Irrigation Water (Tap Water And 50% Diluted Greywater). Phosphorus (As Commercial Triple Superphosphate, Or TSP, RIEDEL-DE HAËN AG, 98% Pure) And L-1 (At Concentrations Of 0, 2, And 4 G)P2O 5. L-1 (Of The Fertiliser) On A Few Morphological And Physiological Characteristics Of The Local Cultivar Of Mung Beans (Vigna Radiata L). On July 17, 2024, Ten Mung Bean Seeds Were Planted In Each Plastic Pot (10 Kg Soil Capacity, As Shown In Table 2-1).. Three Replicates Of Each Treatment Were Used In The Randomised Complete Block Design (RCBD) Experiment. To Keep Soil Moisture Close To Field Capacity, Plants Were Watered With Tap Water Or Diluted Greywater As Needed (E.G., Every 2-3 Days). Five Consistently Growing Seedlings Per Pot Were Selected Ten Days Following Germination. Plants Were Sprayed With The Appropriate Phosphorus And Ascorbic Acid Treatments Thirty Days After Germination. Every Spray Solution Had A Non-Ionic Surfactant (Tween-20, 0.1% V/V) Added To It. Early In The Morning, Spraying Was Done Until The Leaves Were Completely Covered. Thirty Days Following The Initial Spray, A Second One Was Sprayed With The Same Concentrations. All Treatments Received The Same Application Of Other Agronomic Techniques, Such As Hand Weed Control.

2.4. **Investigated Traits And Method Of Investigation**: Upon The Plant's Maturity (Around 121 Days After Planting), The Plants Were Harvested, And The Following Traits Were Measured (Average Of 5 Plants Per Experimental Area):

1. **The Weight Of The Vegetative Parts After Harvest (G. $Plant^{-1}$):** The Average Weight Of The Vegetative Parts Was Determined Immediately After Harvest.

2. **The Weight Of The Vegetative Parts (G. Plant^{-1}):** The Vegetative Parts Were Dried In An Electric Oven At 60°C For 72 Hours Until A Constant Weight Was Achieved, And The Average Dry Weight Was Then Determined.
3. **Number Of Branches (Branch. Plant^{-1}):** The Average Number Of Branches Per Plant Was Determined.
4. **The Percentage Of Soluble Protein In Vegetative Growth (%):** Protein Content In Vegetative Samples (%) Was Determined Using The Method Of Lowry Et Al. (1951) As Amended By Ebru (2004).
5. **100-Seed Weight (G):** One Hundred Seeds Were Selected At Random From The Total Yield Of Each Experimental Unit And Placed On A Weighting Device That Was Sensitive.
6. **Biological Yield (G. Plant-^{1}):** Biological Yield Was Calculated By Adding The Dry Weight Of The Vegetative Growth (G Plant-1) And The Seed Weight (G Plant-1).

2.5. The Statistical Analysis Of The Data Was Performed Using The SAS Software (Version 9, SAS Institute Inc., Cary, NC). The Information Was Subjected To Analysis Of Variance (ANOVA) In Accordance With Thercbd. Daoud And Elias (1990) Described The Duncan's Multiple Range Test (DMRT) As The Primary Tool Used To Assess The Significance Of Differences Between Treatments ($P < 0.05$).

3. RESULTS

3.1. Fresh Weight Of Vegetative Growth (G. Plant^{-1}): The Effects Of Foliar Applications Of Phosphorus And Ascorbic Acid, As Well As Irrigation With Tap And Greywater, On The Fresh Weight Of Vegetative Growth Are Shown In Table 1. According To The Results, There Is No Discernible Difference ($P>0.05$) Between The Effects Of Ascorbic Acid Spray And Irrigation Water Type On This Feature Separately. However, As Compared To The Control Treatment (No Phosphorus Spray), Foliar Application Of Phosphorus Demonstrated A Significant Effect ($P\leq0.05$), With Concentrations Of 4 G. L-1 And 2 G. L-1 Yielding The Greatest Mean Fresh Weights (7.89 And 7.59 G.Plant-1, Respectively).About The Two-Way Interaction Between Water Type Of Irrigation And The Amount Of Ascorbic Acid Sprayed, Table (1) Demonstrated That The Greatest Mean Weight Of Vegetative Growth (7.99 G. Plant-1) Was Attained When Plants Were Irrigated With Tap Water And Sprayed With 50 Mg. L^{-1} Of Ascorbic Acid. Conversely, The Tap Water Irrigation Treatment That Lacked Ascorbic Acid In Their Spray (Ascorbic Acid Control) Had The Lowest Average For This Trait (5.06 G .Plant-^{1}). The Interaction Between The Type Of Water Used For Irrigation And The Phosphorus Spray, As Documented In Table (1), Demonstrated That The Greatest Mean Fresh Weight (9.57 G. Plant-^{1}) Was Achieved With Greywater Irrigation With A 4 G. L-1 Phosphorus Spray, Whereas The Lowest Mean (3.55 G. Plant^{-1}) Was Obtained With Greywater Irrigation Without Additional Phosphorus (Phosphorus Control). The Interaction Between Ascorbic Acid And Phosphorus Spray Is Evident In The Data In Table (1) Which Shows That The Greatest Mean Weight Of Vegetative Growth (9.63 G. Plant^{-1}) Was Achieved By Treating Plants With 50 Mg. L-1 Of Ascorbic Acid And 2 G. L^{-1} Of Phosphorus. The Lowest Average (3.70 G. Plant^{-1}) Was Observed When Spraying 100 Mg. L-1 Of Ascorbic Acid Without Additional Phosphorus (Phosphorus Control).Table (1) Also Shows That The Three-Way Interaction Among Irrigation Water Type, Ascorbic Acid Spray, And Phosphorus Spray Demonstrated That The Highest Mean Fresh Weight Of Vegetative Growth (13.21 G. Plant^{-1}) Was Recorded When Plants Irrigated With Tap Water Were Sprayed With 50 Mg. L^{-1} Of Ascorbic Acid And 2 G. L^{-1} Of Phosphorus. Conversely, The Lowest Mean For This Trait (2.88 G Plant-1) Was Observed With Greywater Irrigation Without Spraying Either Ascorbic Acid Or Phosphorus (Overall Control Treatment).

Table (1): Response Of Mung Bean Plants To Two Types Of Irrigation Water And Spraying With Ascorbic Acid And Phosphorus, And Their Interaction On The Fresh Weight Of The Vegetative Shoot (G.Plant^{-1})

Water Type	Phosphorus Concentrations (G.L^{-1})	Ascorbic Acid Concentrations (Mg.L^{-1})			Average Interaction Effect Between Water Type And Phosphorus
		0	50	100	
Tap Water	0	5.01^{bcd}	5.68^{bcd}	3.81^{cd}	4.83^{b}
	2	2.58^{d}	13.21^{a}	9.86^{abc}	8.55^{a}

	4	7.59^{a-D}	5.07^{bcd}	5.95^{bcd}	6.20^{ab}
Grey Water Diluted 50%	0	2.88^{d}	4.13^{cd}	3.65^{cd}	3.55^{b}
	2	9.43^{a-D}	6.06^{bcd}	4.42^{bcd}	6.63^{ab}
	4	11.11^{ab}	9.88^{abc}	7.74^{a-D}	9.57^{a}
Average Effect Of Ascorbic Acid		6.43^{a}	7.34^{a}	5.91^{a}	
Average Interaction Effect Between Water Type And Ascorbic Acid					
Water Type		Ascorbic Acid Concentrations (Mg.L^{-1})			Average Effect Of Irrigation Water
		0	50	100	
ǀ Tap Water		5.06^{a}	7.99^{a}	6.54^{a}	$^{A}6.53$
Grey Water Diluted 50%		7.80^{a}	6.69^{a}	5.27^{a}	6.59^{a}
Average Interaction Effect Between Phosphorus And Ascorbic Acid					
Phosphorus Concentrations (G.L^{-1})		Ascorbic Acid Concentrations (Mg.L^{-1})			Average Effect Of Phosphorus Concentrations
		0	50	100	
0		$^{C}3.95$	4.91^{bc}	3.73^{c}	4.19^{b}
2		6.00^{abc}	9.63^{a}	7.14^{abc}	7.59^{a}
4		9.35^{ab}	7.47^{abc}	6.85^{abc}	7.89^{a}

3.2. Dry Weight Of Vegetative Growth (G Plant-1) Table (2) Demonstrates The Effects Of Foliar Sprays Of Phosphorus And Ascorbic Acid, As Well As The Irrigation Of Beans With Tap And Graywater, On The Weight Of The Dried Vegetative Development In Mung Beans. The Results Indicate That The Effects Of The Ascorbic Acid Spray And The Irrigation Water Type On This Attribute Are Not Significantly Different ($P<0.05$). In Contrast To The Control Condition (No Phosphorus Spray), The Foliar Application Of Phosphorus Led To A Significant Increase ($P<0.05$) In The Dry Weight Of Vegetative Growth, The Highest Average (3.38 G. Plant^{-1}) Was Recorded At A Dose Of 4 G. L-1, And The Average Of 2 G. L^{-1} Was 2.46 G. Plant^{-1}.

About The Two-Way Interactions, Table (2) Shows That The Interaction Between The Type Of Water Used For Irrigation And The Spray Of Ascorbic Acid Indicates That The Greatest Average Dry Weight Of Vegetative Growth (3.53 G. Plant^{-1}) Was Achieved When Plants Were Irrigated With Greywater Without The Spray Of Ascorbic Acid (Ascorbic Acid Control). The Lowest Average For This Trait (2.02 G. Plant^{-1}) Was Achieved With Water From The Tap That Was Not Supplemented With Ascorbic Acid. The Analysis Of The Interaction Between The Type Of Water Used For Irrigation And The Volume Of Phosphorus Sprayed, As Listed In Table (2), Showed That The Greatest Average Dry Weight Of Vegetative Growth (3.80 G. Plant-1) Was Achieved When Irrigation Water Was Specific To A Color And The Volume Of Phosphorus Was 4 G. L^{-1}. Conversely, The Lowest Average (1.78 G. Plant^{-1}) Was Achieved With Irrigation That Lacked Phosphorus Addition (Phosphorus Control). For The Interaction Between Ascorbic Acid And Phosphorus Spray, Table (2) Shows That The Greatest Average Dry Weight Of

Vegetative Growth (3.77 G. Plant^{-1}) Was Achieved By Treating Plants With 50 Miligrams Of Ascorbic Acid And 2 Miligrams Of Phosphorus. The Lowest Average (1.76 G. Plant^{-1}) Was Recorded When Spraying 50 Mg. L^{-1} Of Ascorbic Acid Alone Without Additional Phosphorus (Phosphorus Control).About The Three-Way Interaction Between Water Type Used For Irrigation, Ascorbic Acid Application, And Phosphorus Application, Table (2) Shows That The Average Dry Weight Of Vegetative Growth Is 5.22 G. The First Experimental Condition (Plant^{-1}) Was Achieved When Plants Were Irrigated With Tap Water And Sprayed With 50 Mg.L-1 Of Ascorbic Acid And 2 G. L^{-1} Of Phosphorus. The Lowest Average For This Trait (1.62 G. Plant^{-1}) Was Achieved With Greywater Irrigation, The Trait Was Applied With 50 Mg. L^{-1} Of Ascorbic Acid, And No Additional Phosphorus Was Sprayed (Phosphorus Control).

Table (2): The Response Of Mung Bean Plants To Two Different Types Of Water Sources And The Spraying Of Ascorbic Acid And Phosphorus, As Well As Their Interaction With The Dry Weight Of The Vegetative Shoot (G.Plant-1)

Water Type	Phosphorus Concentrations (G.L^{-1})	Ascorbic Acid Concentrations (Mg.L^{-1})			Average Interaction Effect Between Water Type And Phosphorus
		0	50	100	
Tap Water	0	2.09^{b-E}	1.90^{cde}	1.93^{b-E}	1.97^{b}
	2	0.90^{e}	5.22^{a}	4.59^{ab}	3.57^{a}
	4	3.09^{a-E}	2.57^{b-E}	3.25^{a-E}	2.97^{ab}
Grey Water Diluted 50%	0	2.00^{b-E}	1.62^{de}	1.72^{cde}	1.78^{b}
	2	$^{A-D}4.06$	2.33^{b-E}	2.03^{b-E}	2.87^{ab}
	4	4.35^{abc}	3.83^{a-D}	3.22^{a-E}	3.80^{a}
Average Effect Of Ascorbic Acid		2.74^{a}	2.91^{a}	2.79^{a}	
Average Interaction Effect Between Water Type And Ascorbic Acid					
Water Type		Ascorbic Acid Concentrations (Mg.L$^{-1)}$			Average Effect Of Irrigation Water
		0	50	100	
Tap Water		2.02^{b}	3.23^{ab}	3.25^{ab}	2.84^{a}
Grey Water Diluted 50%		3.53^{a}	2.59^{ab}	2.32^{ab}	2.82^{a}
Average Interaction Effect Between Phosphorus And Ascorbic Acid					
Phosphorus Concentrations (G.L^{-1})		Ascorbic Acid Concentrations (Mg.L^{-1})			Average Effect Of Phosphorus Concentrations
		0	50	100	
0		2.04^{ab}	1.76^{b}	1.83^{b}	1.88^{b}
2		2.58^{ab}	3.77^{a}	3.31^{ab}	3.22^{a}

4	3.72[a]	3.20[ab]	3.23[ab]	3.38[a]

3.3. Number Of Branches (Branch .Plant^{-1}): Mung Table (3) Shows How Mung Beans React To Phosphorus And Ascorbic Acid Applied To Their Leaves, As Well As To Tap And Greywater Irrigation. The Results Show That The Impacts Of Irrigation Water Type And Phosphorus Spray On This Feature Independently Do Not Differ Significantly ($P>0.05$). However, When Ascorbic Acid Was Given To The Skin, The Number Of Branches Rose Dramatically ($P<0.05$). The Highest Mean Number Of Branches (6.54 Branches) Was Found At A Concentration Of 100 Mg L^{-1}. In Contrast To The Control Treatment, Which Produced No More Than 5.14 Branches, The Ascorbic Acid-Containing Treatment Produced 5.38 Branches. Plant-1. Additionally, Table (3) Shows That The Interaction Between The Type Of Water Used For Irrigation And The Amount Of Ascorbic Acid Sprayed On The Plants Was Significant. When Plants Were Irrigated With Tap Water And Sprayed With 100 Mg. L^{-1} Of Ascorbic Acid, The Highest Average Number Of Branches (7.03 Branches) Was Observed. The First Instance Of This Phenomenon Was Documented In Plant^{-1}. The Use Of Greywater And The 50-Mg L^{-1} Spraying Of Ascorbic Acid Had The Lowest Average For This Attribute (4.29 Branches).Plant-1). The Results In Table (3) Showed That, Regarding The Interaction Between Irrigation Water Type And Phosphorus Spray, Tap Water With A 2 G. L^{-1} Phosphorus Spray Had The Greatest Number Of Branches (6.14 Branches). Plant-1), Whereas The Average Number Of Branches Produced By Greywater Irrigation With No Extra Phosphorus (Phosphorus Oversight) Was 5.08.Plant^{-1}). The Data In Table (3) Indicate That The Greatest Average Number Of Branches (6.83 Branches) Was Observed When Ascorbic Acid Was Sprayed With Phosphorus. The First Generation Of Plants That Were Treated With 100 Mg.L^{-1} Of Ascorbic Acid Without Additional Phosphorus (Phosphorus Oversight). The Lowest Average (4.62 Branches) The Efficacy Of The First Treatment, Which Was Recorded Without Applying Either Ascorbic Acid Or Phosphorus (Overall Control), Was Evaluated.

The Three-Way Interaction Between Water Type, Ascorbic Acid Spray, And Phosphorus Spray, As Documented In Table (3), Showed That The Greatest Mean Number Of Branches (7.44 Branches.Plant^{-1}) Was Achieved When Plants Were Irrigated With Tap Water And Sprayed With 100 Mg. L^{-1} Of Ascorbic Acid And 2 G. L^{-1} Of Phosphorus. Conversely, The Lowest Average For This Trait (4.48 Branches. The Level Of Plant-1) Was Recorded With Greywater Irrigation Without Applying Either Ascorbic Acid Or Phosphorus To The Water (Overall Treatment With Control).

Table (3): The Response Of Mung Bean Plants To Two Different Types Of Water Sources And The Spraying Of Ascorbic Acid And Phosphorus, As Well As Their Interaction With The Number Of Branches (Branch Plant^{-1}).

Water Type	Phosphorus Concentrations (G.L-1)	Ascorbic Acid Concentrations (Mg.L^{-1})			Average Interaction Effect Between Water Type And Phosphorus
		0	50	100	
Tap Water	0	4.77[de]	5.55[b-E]	7.44[a]	5.92[ab]
	2	4.55[de]	6.88[abc]	6.99[ab]	6.14[a]
	4	5.99[a-E]	5.10[cde]	6.66[abc]	5.92[ab]
Grey Water Diluted 50%	0	4.48[e]	4.55[de]	6.22[a-E]	5.08[b]
	2	6.16[a-E]	4.66[de]	5.99[a-E]	5.60[ab]
	4	6.33[a-D]	5.77[a-E]	5.94[a-E]	6.01[ab]
Average Effect Of Ascorbic Acid		5.38[b]	5.42[b]	6.54[a]	

Average Interaction Effect Between Water Type And Ascorbic Acid				
Water Type	Ascorbic Acid Concentrations (Mg.L^{-1})			Average Effect Of Irrigation Water
	0	50	100	
Tap Water	5.10^{bc}	5.84^{bc}	7.03^{a}	5.99^{a}
Grey Water Diluted 50%	5.65^{bc}	4.99^{c}	6.05^{b}	5.56^{a}
Average Interaction Effect Between Phosphorus And Ascorbic Acid				
Phosphorus Concentrations (G.L^{-1})	Ascorbic Acid Concentrations (Mg.L^{-1})			Average Effect Of Phosphorus Concentrations
	0	50	100	
0	4.62^{d}	5.05^{cd}	6.83^{a}	5.50^{a}
2	5.35^{bcd}	5.77^{a-D}	6.49^{ab}	5.87^{a}
4	6.16^{abc}	5.44^{bcd}	6.30^{ab}	5.96^{a}

3.4. Protein Content In Vegetative Growth (%)**:**Table (4) Shows The Response Of Mung Bean To Irrigation With Tap And Greywater, And Foliar Application Of Ascorbic Acid And Phosphorus, And Their Interactions On The Protein Content In Vegetative Growth. The Table Shows That Irrigation Water Type Had A Significant Effect ($P<0.05$) On This Trait, With Plants Irrigated With Greywater Recording A Mean Protein Content (15.94%) Significantly Higher Than Those Irrigated With Tap Water (12.63%). Foliar Application Of Ascorbic Acid Also Significantly ($P<0.05$) Affected Protein Content, With The Highest Mean (15.50%) Recorded Without Ascorbic Acid Spray (Control Treatment), And Protein Content Decreased With Increasing Ascorbic Acid Concentration. In Contrast, Foliar Application Of Phosphorus Did Not Show A Significant Individual Effect ($P>0.05$) On Protein Content In Vegetative Growth.Table (4) Also Shows That The Two-Way Interaction Between Irrigation Water Type And Ascorbic Acid Spray Indicated That The Highest Mean Protein Content (18.05%) Was Recorded When Irrigating Plants With Greywater Without Ascorbic Acid Spray (Ascorbic Acid Control), While The Lowest Mean (11.87%) Was Recorded With Tap Water Irrigation And Spraying With 100 Mg. L^{-1} Of Ascorbic Acid.Regarding The Interaction Between Irrigation Water Type And Phosphorus Spray, The Results In
Table (4) Showed That Greywater Irrigation Without Phosphorus Spray (Phosphorus Control) Yielded The Highest Mean Protein Content (16.84%), While The Lowest Mean (12.13%) Was Recorded With Tap Water Irrigation And Spraying With 4 G. L^{-1} Of Phosphorus. Concerning The Interaction Between Ascorbic Acid And Phosphorus Spray, Data In Table (4) Indicate That The Highest Mean Protein Content (19.43%) Resulted From Not Spraying Either Ascorbic Acid Or Phosphorus (Overall Control Treatment). The Lowest Mean (10.76%) Was Recorded When Spraying 100 Mg .L^{-1} Of Ascorbic Acid Without Phosphorus Addition (Phosphorus Control).
The Three-Way Interaction Among Irrigation Water Type, Ascorbic Acid Spray, And Phosphorus Spray, As Shown In Table (4), Indicated That The Highest Mean Protein Content In Vegetative Growth (24.02%) Was Recorded When Plants Irrigated With Greywater Were Not Sprayed With Either Ascorbic Acid Or Phosphorus (Overall Control Treatment). Conversely, The Lowest Mean For This Trait (9.94%) Was Observed With Tap Water Irrigation, Spraying With 100 Mg. L^{-1} Of Ascorbic Acid, And No Phosphorus Spray (Phosphorus Control).
Table (4): Response Of Mung Bean Plants To Two Types Of Irrigation Water And Spraying With Ascorbic Acid And Phosphorus, And Their Interaction On The. Protein Content In Vegetative Growth (%)

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Average Interaction Effect Between Water Type And Phosphorus	Ascorbic Acid Concentrations (Mg.L^{-1})			Phosphorus Concentrations (G.L^{-1})	Water Type
	100	50	0		
13.00^{bc}	9.94^{c}	14.21^{bc}	14.84^{bc}	0	Tap Water
12.76^{bc}	12.30^{bc}	13.72^{bc}	12.26^{bc}	2	
12.13^{c}	13.38^{bc}	11.27^{bc}	11.74^{bc}	4	
16.84^{a}	11.58^{bc}	14.93^{bc}	24.02^{a}	0	Grey Water Diluted 50%
14.52^{ab}	12.23^{bc}	17.77^{b}	13.54^{bc}	2	
16.45^{ab}	17.25^{bc}	15.53^{bc}	16.58^{bc}	4	
	12.78^{b}	14.57^{ab}	15.50^{a}	Average Effect Of Ascorbic Acid	
Average Interaction Effect Between Water Type And Ascorbic Acid					
Average Effect Of Irrigation Water	Ascorbic Acid Concentrations (Mg.L^{-1})			Water Type	
	100	50	0		
12.63^{b}	11.87^{c}	13.07^{bc}	12.95^{bc}	Tap Water	
15.94^{a}	13.68^{bc}	16.07^{ab}	18.05^{a}	Grey Water Diluted 50%	
Average Interaction Effect Between Phosphorus And Ascorbic Acid					
Average Effect Of Phosphorus Concentrations	Ascorbic Acid Concentrations (Mg.L^{-1})			Phosphorus Concentrations (G.L^{-1})	
	100	50	0		
14.92^{a}	10.76^{c}	14.57^{bc}	^{A}19.43	0	
14.29^{a}	12.26^{bc}	15.75^{ab}	12.91^{bc}	2	
13.64^{a}	15.31^{abc}	13.40^{bc}	14.16^{bc}	4	

3.5. 100-Seed Weight (G): Table (5) Shows The Response Of Mung Bean To Irrigation With Tap And Greywater, And Foliar Application Of Ascorbic Acid And Phosphorus, And Their Interactions On 100-Seed Weight. The Data Therein Indicate That Irrigation Water Type Had A Significant Effect ($P<0.05$), When Compared To Greywater, Plants Irrigated With Tap Water Had The Highest Mean 100-Seed Weight (3.64 G). This Feature Was Likewise Significantly ($P<0.05$) Impacted By Foliar Ascorbic Acid Administration; The Greatest Mean (3.79 G) Was Observed In The Control Condition, Which Did Not Use Ascorbic Acid Spray. In Comparison To The Control Treatment (No Phosphorus Spray), Phosphorus Spray Also Shown A Significant Effect ($P<0.05$), With Concentrations Of 2 G. L-1 And 4 G. L-1 Producing The Greatest Mean 100-Seed Weights (3.76 And 3.53 G, Respectively).
Additionally, Table (5) Demonstrates That The Two-Way Interaction Between The Type Of Irrigation Water And The Ascorbic Acid Spray Revealed That The Plants That Were Irrigated With Tap Water And Sprayed With 100

Mg L-1 Of Ascorbic Acid Had The Highest Mean 100-Seed Weight (4.00 G). With Greywater Irrigation And 50 Mg L-1 Of Ascorbic Acid Sprayed, The Trait's Lowest Mean (2.82 G) Was Observed. With Respect To The Interplay Between Irrigation Water Type And Phosphorus Spray, Table 5's Findings Demonstrated That Tap Water Irrigation With A 2 G. L-1 Phosphorus Spray Produced The Highest Mean 100-Seed Weight (4.09 G), Whereas Greywater Irrigation Without Phosphorus Addition (Phosphorus Control) Produced The Lowest Mean (2.74 G). Regarding The Interaction Between Phosphorus Spray And Ascorbic Acid, Table 5 Shows That The Highest Mean 100-Seed Weight (4.09 G) Was Obtained When 2 G L-1 Of Phosphorus Was Sprayed Instead Of Ascorbic Acid (Ascorbic Acid Control). Spraying 50 Mg L-1 Of Ascorbic Acid Without Adding Phosphorus (Phosphorus Control) Produced The Lowest Mean (2.33 G).
The Three-Way Interaction Among Irrigation Water Type, Ascorbic Acid Spray, And Phosphorus Spray, As Shown In Table (5), Indicated That The Highest Mean 100-Seed Weight (4.34 G) Was Recorded When Plants Irrigated With Tap Water Were Not Sprayed With Ascorbic Acid (Ascorbic Acid Control) And Were Sprayed With 2 G. L^{-1} Of Phosphorus. Conversely, The Lowest Mean For This Trait (2.25 G) Was Observed With Tap Water Irrigation, Spraying With 50 Mg. L^{-1} Of Ascorbic Acid, And No Phosphorus Spray (Phosphorus Control).
Table (5): Response Of Mung Bean Plants To Two Types Of Irrigation Water And Spraying With Ascorbic Acid And Phosphorus, And Their Interaction On The 100-Seed Weight (G)

Water Type	Phosphorus Concentrations ($G.L^{-1}$)	Ascorbic Acid Concentrations ($Mg.L^{-1}$)			Average Interaction Effect Between Water Type And Phosphorus
		0	50	100	
Tap Water	0	3.88^{ab}	2.25^{e}	$3.15^{a\text{-}B}$	3.09^{bc}
	2	4.36^{a}	4.11^{ab}	3.81^{ab}	4.09^{a}
	4	3.78^{abc}	3.96^{ab}	$3.48^{a\text{-}E}$	3.74^{ab}
Grey Water Diluted 50%	0	$3.54^{a\text{-}E}$	2.42^{bcd}	2.26^{e}	2.74^{c}
	2	3.83^{ab}	2.34^{de}	4.11^{ab}	3.43^{abc}
	4	$3.39^{a\text{-}E}$	$3.70^{a\text{-}D}$	$2.89^{b\text{-}E}$	3.33^{bc}
Average Effect Of Ascorbic Acid		3.79^{a}	3.13^{b}	3.28^{b}	
Average Interaction Effect Between Water Type And Ascorbic Acid					
Tap Water		Ascorbic Acid Concentrations ($Mg.L^{-1}$)			Average Effect Of Irrigation Water
		0	50	100	
Tap Water		4.00^{a}	3.44^{abc}	3.48^{abc}	3.64^{a}
Grey Water Diluted 50%		3.59^{ab}	2.82^{c}	3.09^{bc}	3.16^{b}
Average Interaction Effect Between Phosphorus And Ascorbic Acid					
Phosphorus Concentrations ($G.L^{-1}$)		Ascorbic Acid Concentrations ($Mg.L^{-1}$)			Average Effect Of Phosphorus Concentrations
		0	50	100	

0	A3.71	2.33c	2.70bc	2.91b
2	4.09a	3.23abc	3.96a	3.76a
4	3.58ab	3.83a	3.19abc	3.53a

3.6. Biological Yield (G. Plant-1): Table (6) Demonstrates The Response Of Mung Bean To Irrigation With Tap And Greywater, As Well As The Foliar Application Of Ascorbic Acid And Phosphorus, And Their Interactions With Regard To Biological Yield. The Findings Here Indicate That There Are No Significant Differences ($P<0.05$) In The Individual Effects Of Irrigation Water Type Or The Spray Of Ascorbic Acid, Nor In The Two-Way Interaction Between These Two Water Types And The Spray Of Ascorbic Acid, On Biological Yield. Conversely, The Application Of Phosphorus To Foliage Led To A Significant Increase ($P<0.05$) In This Trait, With The Highest Concentrations Of 4 G. L^{-1} And 2 G. L^{-1} Having The Greatest Mean Biological Yields (4.98 And 4.76 G. Plant-1, Respectively) Compared To The Control Treatment (No Phosphorus Spray).

Table (6) Demonstrates That The Interaction Between Water Type For Irrigation And Phosphorus Spray Has Indicated That The Greatest Mean Biological Yield (5.43 G. Plant-1) Was Achieved When Irrigation Was Performed With Greywater And The Phosphorus Concentration Was 4 G. L-1. The Lowest Average (2.73 G. Plant-1) Was Observed With Tap Water Irrigation That Lacked Phosphorus Addition (Phosphorus Control). The Interaction Between Ascorbic Acid And Phosphorus Spray Was Observed In Table (6); The Results Showed That The Highest Average Biological Yield (5.97 G. $Plant^{-1}$) Was Achieved When 50 Mg. L^{-1} Of Ascorbic Acid Was Sprayed With 2 G. L^{-1} Of Phosphorus, And The Lowest Average (2.84 G. $Plant^{-1}$) Was Obtained When 100 Mg. L^{-1} Of Ascorbic Acid Was Sprayed Without Additional Phosphorus (Phosphorus Control).The Three-Way Interaction Between Irrigation Water Type, Ascorbic Acid Spray, And Phosphorus Spray, As Documented In Table (6), Showed That The Greatest Mean Biological Yield (6.72 G. $Plant^{-1}$) Was Achieved When Plants Were Irrigated With Greywater And Had No Sprayed With Ascorbic Acid (Controlling Of Ascorbic Acid), And Instead Were Sprayed With 4 G. L-1 Of Phosphorus. On The Other Hand, The Lowest Average For This Trait (1.46 G . $Plant^{-1}$) Was Recorded With Tap Water Irrigation, Instead Of Spraying Ascorbic Acid (Which Is Used To Control Ascorbic Acid), The Trait Was Also Sprayed With 2 G. L^{-1} Of Phosphorus.

Table (6): The Response Of Mung Bean Plants To Two Different Types Of Water Sources And The Spraying Of Ascorbic Acid And Phosphorus, As Well As Their Interaction With The Biological Yield (G. $Plant^{-1}$), Is Listed.

Average Interaction Effect Between Water Type And Phosphorus	Ascorbic Acid Concentrations ($Mg.L^{-1}$)			Phosphorus Concentrations ($G.L^{-1}$)	Water Type
	100	50	0		
2.73b	2.63abc	2.44bc	3.14abc	0	Tap Water
4.79ab	6.55ab	6.38ab	1.45c	2	
4.54ab	5.15abc	3.83abc	4.65abc	4	
3.22ab	3.06abc	3.26abc	3.36abc	0	Grey Water 50%
4.73ab	4.18abc	5.57abc	4.45abc	2	
5.43a	4.28abc	5.29abc	6.72a	4	
	4.31a	4.46a	3.96a	Average Effect Of Ascorbic Acid	
Average Interaction Effect Between Water Type And Ascorbic Acid					

Average Effect Of Irrigation Water	Ascorbic Acid Concentrations ($Mg.L^{-1}$)			Water Type
	100	50	0	
4.02^{a}	4.78^{a}	4.21^{a}	3.08^{a}	Tap Water
4.46^{a}	3.83^{a}	4.70^{a}	4.84^{a}	Grey Water Diluted 50%
Average Interaction Effect Between Phosphorus And Ascorbic Acid				
Average Effect Of Phosphorus Concentrations	Ascorbic Acid Concentrations ($Mg.L^{-1}$)			Phosphorus Concentrations ($G.L^{-1}$)
	100	50	0	
2.98^{b}	2.84^{b}	2.85^{b}	3.25^{ab}	0
4.76^{a}	5.37ab	5.97a	2.95b	2
4.98^{a}	4.71^{ab}	4.56^{ab}	5.68^{ab}	4

4. DISCUSSION

The Results Of This Study Revealed Varied Effects Of Irrigation Water Type (Tap Water And 50% Diluted Greywater), Foliar Application Of Ascorbic Acid, And Phosphorus, As Well As Their Interactions, On Several Morphological And Physiological Traits Of Mung Bean.

4.1. Effect Of Irrigation Water Type: The Use Of Greywater To Irrigate Had A Significant Positive Impact On The Protein Content Of The Vegetative Growth Of Mung Beans Compared To Tap Water (Table 4). This Concords With The Findings Of Mirsa Et Al. (2009), Who Suggested That Greywater May Have Crucial Nutrients That Increase Biomass And Consequently Increase Protein Content. Other Investigations, Such As The One Conducted By Ikhajiagbe Et Al. (2020) On Mung Bean, Demonstrated A Similar Increase In Protein Composition With Water Usage In Grey. This Improvement Can Be Explained By The Fact That Greywater (After Diluting, As Shown By The Water Analysis In Table 2-2) Has More Available Nutrients Like Nitrogen, Phosphorus, And Potassium Than Tap Water, Which Promotes The Synthesis Of Proteins And Amino Acids. The Synthesis Of Proteins And Amino Acids Benefits From This Action. In Contrast, Irrigating With Tap Water Significantly Impacted The 100-Seed Weight As Compared To Greywater (Table 5). This Result Is Consistent With That Of Olever And Hossain (2016), Who Found That Irrigating 100 Maize Seeds With Greywater Reduced Their Weight. Even When Diluted, The Presence Of Greywater May Be The Cause Of This. , That Could Contain A Higher Concentration Of Salts Or Other Substances (Such As Sodium Or Boron, If Not Well-Managed, Or Specific Organic Compounds), That Can Negatively Affect The Filling Of Seeds And The Development Of The Plant, Even When There Is A Clear Negative Effect On The Overall Vegetative Growth. However, The Water Type Had No Significant Individual Effect On The Fresh Or Dry Weight Of Vegetative Growth, The Number Of Branches, Or The Biological Yield, These Data Suggest That, Under The Conditions Of This Experiment, M. Grangeri Had A Degree Of Tolerance To Dilute Water Regarding The General Parameters Listed Above. This Is In Line With Agra's Study. (2018), Who Proposed That Greywater Could Be Utilized As An Alternative To Irrigation In Situations With Little Water Scarcity, But Noted That This Would Have A Limited Impact On The Number Of Branches In Beans**.**

4.2. Effect Of Foliar Application Of Ascorbic Acid: The Number Of Branches Increased Significantly When Ascorbic Acid Was Applied To The Foliage (Table 3). A Concentration Of 100 Mg Produced The Greatest Rise In Branches. L-1. Ascorbic Acid's Function As A Growth Enhancer And Anti-Inflammatory That Promotes Cell Growth And Expansion, Particularly In The Lateral Buds, Is Responsible For This Rise, Which Is Consistent With The Findings Of Hassan Et Al. (2019); Additionally, The Control Treatment Had The Highest Values For These

Traits (AL-Alawy Et Al, 2020). Interestingly, Ascorbic Acid Had A Significant Negative Effect On The Protein Content In The Vegetative Growth And The Weight Of 100 Seeds (Tables 4 And 5). This Implies That The Optimal Effect Of Ascorbic Acid May Be Dependent On The Concentration, The Physiological State Of The Plant, And The Specific Trait Being Examined. While It Can Increase Vegetative Growth And Branch Development At Specific Concentrations, It May Not Have The Same Positive Effect On Yield Components Or Quality Directly, Or It May Lead To A Distribution Of Nutrients Throughout The Plant That Affects These Traits When Other Factors Are Absent (Shalata And Neumann, 2001). Ascorbic Acid Had No Significant Individual Effect On The Weight Of The Fresh Or Dry Vegetative Growth Or Yield Of Biological Substances.

4.3. Effect Of Foliar Application Of Phosphorus: The Foliar Application Of Phosphorus Had The Greatest Positive Effect On The Majority Of The Traits Studied. It Resulted In A Significant Increase In The Weight Of Vegetative Growth, 100 Seeds, And The Biological Yield (Tables 1, 2, 5, 6). These Increases Are Attributed To The Crucial Role Of Phosphorus In Numerous Essential Processes In The Plant That Are Essential. It's A Part Of The Energy Molecule (ATP), Nucleic Acid, And Phospholipid, And It Participates In The Activation Of Numerous Enzymes Necessary For The Synthesis Of Carbohydrates And Proteins (Lu Et Al., 2023). Phosphorus Also Promotes The Growth Of The Root System, This Is Not Measured In This Study, But It Increases The Efficiency Of Water And Nutrient Absorption, Which Benefits The Vegetative Growth And Yields Formation (Ahmad And EL-Abagy, 2007; Ndakidemi And Dakora, 2007). These Findings Are In Agreement With Previous Studies That Have Demonstrated The Importance Of Phosphate Fertilization In Increasing Growth And Productivity In Various Plants (Al-Saadi And Al-Rubaie, 2014; Al-Shindah, 2019; Bogapov, 2020). Phosphorus Did Not Have An Effect On The Number Of Branches Or The Protein Content In Vegetative Growth, Which Could Indicate That The Available Phosphorus In The Soil (As Shown In Table 2-1) Or From Other Treatments Is Sufficient To Support These Traits, Or That Other Factors Are More Significant In Regards To Their Support**.**

4.4. Effect Of Interactions Among Factors: The Two-Way And Three-Way Interactions Among The Studied Factors Demonstrated Complex And Interesting Effects, Confirming That Plant Response Is Not Merely The Sum Of Individual Factor Effects But Rather The Product Of Synergistic Or Sometimes Antagonistic Interactions.

In The Interaction Between **Water Type And Ascorbic Acid** It Was Observed That Tap Water Irrigation With A 50 Mg. L^{-1} Spray Of Ascorbic Acid Yielded The Highest Fresh Weight (Table 1), While A 100 Mg. L^{-1} Spray With Tap Water Resulted In The Highest Number Of Branches And 100-Seed Weight (Tables 3 And 5). This Suggests That The Optimal Concentration Of Ascorbic Acid Might Vary Depending On The Target Trait And The Type Of Irrigation Water. Conversely, Greywater With No Ascorbic Acid Spray Produced The Highest Dry Weight And Protein Content (Tables 2 And 4), Which Might Indicate That The Potential Nutritional Benefits Of Greywater Could Be Sufficient To Support These Traits Without External Ascorbic Acid Addition, Or That Ascorbic Acid Might Have A Less Positive Effect Under The Potentially Different Chemical Conditions Of Greywater Irrigation.The Interaction Between **Water Type And Phosphorus** Was Also Noteworthy. Greywater Irrigation With Phosphorus Application (Especially At 4 G. L^{-1}) Led To High Values For Fresh And Dry Weight Of Vegetative Growth And Biological Yield (Tables 1, 2, 6), As Well As For Protein Content (With No Phosphorus Spray Or Low Concentrations Thereof) (Table 4). This Supports The Idea That Greywater Can Be An Additional Source Of Nutrients, And When Supplemented With Phosphorus, It Can Significantly Enhance Growth. This Could Be Explained By The Added Phosphorus Helping The Plant To Optimally Utilize The Nutrients Present In Greywater, Or By Compensating For Any Potential Deficiencies. In Contrast, Tap Water Irrigation With Phosphorus Spray Showed Superiority In 100-Seed Weight (Table 5) And Some Aspects Of Vegetative Growth, Which Might Reflect The Quality Of Tap Water As A Less Stressful Medium For Phosphorus Uptake And Its Translocation Towards Seed Formation.The Interaction Between **Ascorbic Acid And Phosphorus** Also Highlighted The Importance Of Balance Between These Two Factors. For Instance, Spraying 50 Mg. L^{-1} Ascorbic Acid With 2 G .L^{-1} Phosphorus Yielded The Highest Fresh And Dry Weight And Biological Yield (Tables 1, 2, 6), Whereas No Ascorbic Acid Spray With 2 G L-1 Phosphorus Resulted In The Highest 100-Seed Weight (Table 5). This Indicates A Potential Synergistic Effect Between A Moderate Concentration Of Ascorbic Acid And Phosphorus On Vegetative Growth, While Phosphorus Alone Might Be More Effective In Enhancing Seed Weight. The Role Of Ascorbic Acid In This Case Could Be Related To Improving Phosphorus Uptake Or Its Utilization Efficiency Within The Plant, Or By

Enhancing The Plant's Ability To Tolerate Any Mild Stress (Hassanein Et Al., 2009; Amin Et Al., 2008).The **Three-Way Interactions** Were The Most Complex But Highlighted The Potential For Achieving Distinct Results Under Specific Conditions. For Example, Obtaining The Highest Fresh Weight, Number Of Branches, And 100-Seed Weight With Tap Water Irrigation Combined With Specific Concentrations Of Ascorbic Acid And Phosphorus (Tables 1, 3, 5) Suggests These Treatments Might Be Optimal Under Freshwater Conditions. Meanwhile, Achieving The Highest Protein Content And Biological Yield With Greywater Irrigation And Specific Phosphorus Concentrations (And Without Ascorbic Acid In Some Cases) (Tables 4, 6) Underscores The Latent Potential Of Greywater When Managed Correctly And Supplemented With Necessary Elements. The Reduction In Some Traits (Like Fresh Weight With Greywater Irrigation Without Additives) Could Be Attributed, As Mentioned Earlier, To Increased Salinity Or The Presence Of Certain Ions At Non-Optimal Concentrations In Untreated Or Unsupplemented Greywater, Affecting Vital Physiological Processes Such As Photosynthesis And Nutrient Uptake (Wahome Et Al., 2007).Overall, These Results Indicate That The Optimal Response Of Mung Bean Depends On The Appropriate Combination Of Irrigation Water Type And Foliar Treatments. The Use Of Diluted Greywater Can Be A Promising Option, Especially When Supplemented With Phosphorus, But Its Potential Effects On Some Aspects Of Yield Quality, Such As Seed Weight, Must Be Considered. The Role Of Ascorbic Acid Also Appears To Be Highly Dependent On Other Conditions And The Target Trait.

5. CONCLUSIONS

Based On The Results Of This Study, The Following Can Be Concluded:

- Irrigation With Tap Water Showed Superiority In Increasing 100-Seed Weight, While Diluted Greywater Irrigation Enhanced The Protein Content In The Vegetative Growth Of Mung Bean.
- Foliar Application Of Ascorbic Acid (100 Mg. L^{-1}) Led To A Significant Increase In The Number Of Branches.
- Foliar Application Of Phosphorus (Especially At A Concentration Of 4 G. L^{-1}) Had The Greatest Effect In Increasing The Fresh And Dry Weight Of Vegetative Growth And Biological Yield, And It Also Improved 100-Seed Weight At A Concentration Of 2 G. L^{-1}.
- Interactions Among The Studied Factors Revealed Complex Responses, Where Some Combinations (Such As Tap Water With Ascorbic Acid And Phosphorus) Showed Superiority In Some Vegetative Growth Traits And Seed Quality, While Other Combinations (Such As Greywater With Phosphorus) Yielded Promising Results For Some Growth Traits And Protein Content.
- Overall, The Results Indicate The Possibility Of Using Diluted Greywater As A Partial Alternative To Traditional Irrigation Water For Mung Bean, Especially When Supplemented With Foliar Application Of Phosphorus, With Attention To Its Effect On Some Yield Components.

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