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EFFECTS OF SULPHATE OF POTASH (SOP) FERTILIZER ON SWEET PEPPER (*CAPSICUM ANNUUM L.*) PRODUCTION IN TURBAT



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Abstract

The pot experiment was conducted at the green house under three replicated Completely Randomized Design (CRD) at the Research farm Turbat, Balochistan in 2022 to evaluate the different levels of sulphate of potash (SOP) on sweet pepper. The treatments included $T_1 = \text{SOP} = 0 \text{ g/kg}$ (control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$ and $T_4 = \text{SOP} = 60 \text{ g/kg}$. It was noted that the growth and fruit yield of sweet pepper were significantly ($P < 0.05$) affected by different levels of sulphate of potash (SOP). Sweet pepper fertilized with $T_4 = \text{SOP} = 60 \text{ g/kg}$ resulted with 44.55 number of leaves plant⁻¹, 18.19 number of branches plant⁻¹, 54.44 cm plant height, 51.12 days to 1st flowering, 9.52 cm fruit length, 2.00 cm fruit diameter, 98.82 number of fruits plant⁻¹, 2.89 g single fruit weight, 573.57 g fruit yield plant⁻¹, 78.7 potassium content in soil, 129.8 potassium content in plant, 15.00 sulphate content in soil and 11.52 sulphate content in plant. Similarly, sweet pepper fertilized with $T_3 = \text{SOP} = 40 \text{ g/kg}$, 38.48 number of leaves plant⁻¹, 16.72 number of branches plant⁻¹, 49.50 cm plant height, 48.54 days to 1st flowering, 9.29 cm fruit length, 1.59 cm fruit diameter, 81.34 number of fruits plant⁻¹, 2.61 g single fruit weight, 491.37 g fruit yield plant⁻¹, 66.9 potassium content in soil, 124.4 potassium content in plant 13.62 sulphate content in soil and 9.87 sulphate content in plant. The sweet pepper receiving $T_2 = \text{SOP} = 20 \text{ g/kg}$, 29.74 number of leaves plant⁻¹, 15.00 number of branches plant⁻¹, 43.63 cm plant height, 45.42 days to 1st flowering, 8.55 cm fruit length, 1.36 cm fruit diameter, 59.40 number of fruits plant⁻¹, 2.51 g single fruit weight, 408.64 g fruit yield plant⁻¹, 57.6 potassium content in soil, 120.5 potassium content in plant, 10.82 sulphate content in soil, and 7.49 sulphate content in plant. $T_1 = \text{SOP} = 0 \text{ g/kg}$ (control) resulted with 24.51 number of leaves plant⁻¹, 12.54 number of branches plant⁻¹, 39.16 cm plant height, 43.12 days to 1st flowering, 8.23 cm fruit length, 1.08 cm fruit diameter, 40.25 number of fruits plant⁻¹, 2.27 g single fruit weight, 353.64 g fruit yield plant⁻¹, 45.2 potassium content in soil, 110.2 potassium content in plant, 7.47 sulphate content in soil and 5.28 sulphate content in plant. After going through the findings of the present research, it was concluded that the growth and yield of sweet pepper increased simultaneously with increasing sulphate of potash (SOP) levels; and the sweet pepper fertilized with $T_4 = \text{SOP} = 60 \text{ g/kg}$ resulted in highest.

Keywords: *Capsicum annuum L.*, Fertilizers, Growth, Sulphate of potash (SOP), Sweet pepper

INTRODUCTION

Sweet pepper (*Capsicum annuum L.*) is one of the most well-liked and valuable vegetable crops farmed for its immature fruits. Both cooked veggies and fresh salads contain it. When ripe, it is a good source of vitamin A as well as vitamins C, E, K, and folate. Additionally, it has a lot of antioxidant chemicals (1). After the potato and the tomato, it is regarded as the third-most important plant in the Solanaceae family. China is the second-largest producer in the world, behind India. Pepper is produced all over the world, with the exception of the continent of Antarctica and its origin is connected to Christopher Columbus's expedition. He introduced hot pepper to Europe, Africa and Asia. The cultivation of the chilli crops began least 7500 BC, after a quick spread in Europe, in 1990, it spread to Japan, India, and China. In 2009, there were 11 million tons of sweet peppers produced globally. China has surpassed Turkey and



Mexico to take the top spot as the world's top producer of capsicums, each contributing 50% of global production. Over 1.8 million acres were worldwide under production of green peppers. Around 25 different types are typically grown all throughout the world. It is estimated that 7182 thousand tons of chili are produced annually on a total of 1776 thousand hectares. It is a great source of vitamins E and P, as well as the A, B, and C vitamins (340 mg per 100 grams). Young red chilies contain more vitamin A compared to carrot and fresh green chili peppers contain higher levels of vitamin C compared to citrus fruits. Additionally, bakers and the food industry use it in products like curry powder, chili paste, and other ingredients (2).

Pakistan's most valued and significant cash crop is sweet pepper. In Pakistan, 62,742 acres were used for the production of dry chilies in 2015–16, down from 63,617 ha in 2012–13 and a 1.5% percentage of GDP. It is one of the vegetables that can greatly increase exports and assist farmers in reducing their reliance on conventional crops. Numerous genotypes of chilli are grown in Balochistan depending on production and consumer choice. By supplying high-quality inputs, any crop's production can be increased. Given that capsicum is known to respond favorably to the use of potassium fertilizers, nutrition is crucial to the development and growth of any crop, including this one in the upper regions of Balochistan, especially in Quetta (3).

Potassium is linked to the transport of water, nutrients, and carbohydrates through plant tissues. It also plays a role in the activation of enzymes that influence protein stages and the creation of adenosine triphosphate (ATP), which controls the process of photosynthesis. Potassium is an essential nutrient for plant growth. It is classified a macronutrient because plants take large quantities. One of the nutrients used in chilli is potassium (K), which is crucial for plant growth. According to (4), it has a well-established role in the photosynthetic enzyme process, protein and carbohydrate synthesis, and the development of pest and disease resistance. Most soils in Pakistan contain significant amounts of total K as an ingredient of comparatively insoluble minerals, but only a very small portion is in a form that plants can use (5). (6) Suggested that late foliar application of nutrients showed positively impacted on the chilli yield. Potassium is an essential nutrient for all living organisms. It is required in huge amounts for average plant growth and development. Potassium shortage symptoms include vein-intersecting yellow patches and a yellowish-white mottling that changes to a light yellow and green tint. The centers of these spots fade, leaving a large number of brown specks around the tips of leaves, along edges, and in between veins (7). The edges and tips initially detach and curl downward. The entire leaf turns reddish brown as the symptoms worsen, dries, and appears burned and blackened. Premature leaf drop is another trait that can impair cotton boll development, causing cotton bolls to not mature or only partially split and contain poor quality fiber. After potassium, which must be administered in appropriate amounts to grow productive and healthy chilli plants, potassium is regarded as a crucial nutrition element for the plants (4).

MATERIALS AND METHODS

The experiment was conducted at the green house under Complete Randomize Design (CRD) at site, Research farm Turbat, Balochistan in 2022. The experiment was conducted in the pot. The treatments included T₁=SOP=0 g/kg (Control), T₂= SOP=20 g/kg, T₃= SOP=40 g/kg, T₄= SOP=60g/kg. The observations were recorded on Number of leaves plant⁻¹, Number of branches plant⁻¹, plant height (cm), days to 1st flower, fruit length (cm), fruit diameter, number of fruit plant⁻¹, single fruit weight, fruit yield plant⁻¹, potassium content in soil, potassium content in plant, sulfur content in soil, sulfur content in plant.

STATISTICAL DESIGN

Using the MSTAT-C software package tool, the data collected for various characters was statistically evaluated to look for any discernible differences in how they were treated. Analyzing the variance was done along with calculating the average values of each character. The Least Significant Difference Test (LSD) was used to calculate the significance of the differences between the treatment means at a 5% level of probability (8).

RESULTS AND DISCUSSION

NUMBER OF LEAVES PLANT⁻¹

The results of the investigation into the impact of different sulphate-of-potash fertilizer concentrations on sweet pepper are shown in Fig. 2 for the number of leaves on plant⁻¹. The findings shows that maximum number of leaves plant⁻¹ was (44.55) when T₄ = SOP = 60 g/kg was applied to the sweet pepper, followed by (38.48) under sulphate of potash levels of T₃ = SOP = 40 g/kg. The number of leaves plant⁻¹ at maturity of sweet pepper was further decreased to and 29.74 for sulphate of potash application @ T₂ = SOP = 20 g/kg, respectively. Minimum (24.51) number of leaves plant⁻¹ of sweet pepper was observed with T₁ = SOP = 0 g/kg (Control). This indicates that the sulphate of potash fertilizer application of T₄ = SOP = 60 g/kg is highly beneficial for obtaining maximum number of leaves plant⁻¹ at maturity. With regard to the interaction impact, every measured vegetative parameter showed substantial variations in both seasons, with the exception of the number of branches per plant (9).

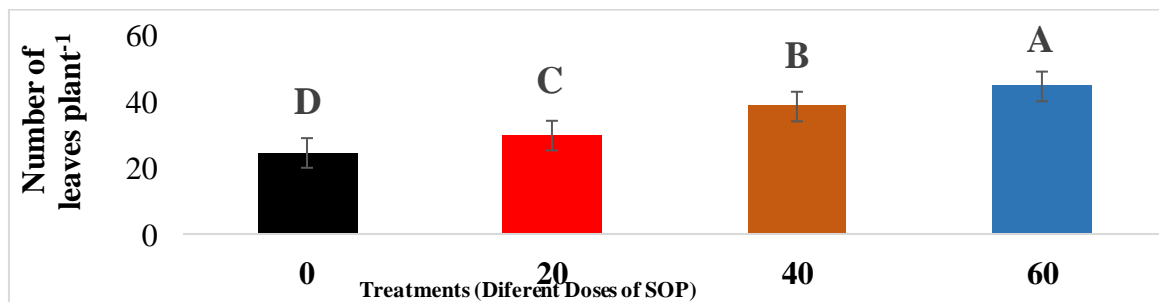


Fig. 1. Effect of different level of sulphate of potash (T₁ = SOP = 0 g/kg (Control), T₂ = SOP = 20 g/kg, T₃ = SOP = 40 g/kg, T₄ = SOP = 60 g/kg) on sweet pepper Number of leaves plant⁻¹ at (0.05)

NUMBER OF BRANCHES PLANT⁻¹

The findings of the investigation into the effects of various concentrations of sulphate of potash fertilizer on sweet pepper are shown in Fig. 2 for number of branches plant⁻¹. The results shows that the number of branches plant⁻¹ at maturity was maximum (18.19) when T₄ = SOP = 60 g/kg was applied to the sweet pepper, followed by (16.72) under sulphate of potash levels of T₃ = SOP = 40 g/kg. The number of branches plant⁻¹ at maturity of sweet pepper was further decreased to and 15.00 for sulphate of potash application @ T₂ = SOP = 20 g/kg, respectively. Minimum (12.54) number of branches plant⁻¹ of sweet pepper was observed with T₁ = SOP = 0 g/kg (Control). This indicates that the sulphate of potash fertilizer application of T₄ = SOP = 60 g/kg is very helpful for getting the most branches plant⁻¹ when it reaches maturity. With the exception of the number of branches per plant, which did not significantly change in the second season alone, all vegetative growth characteristics significantly increased as potassium fertilization rates increased from 50 to 200 kg/fed (10).

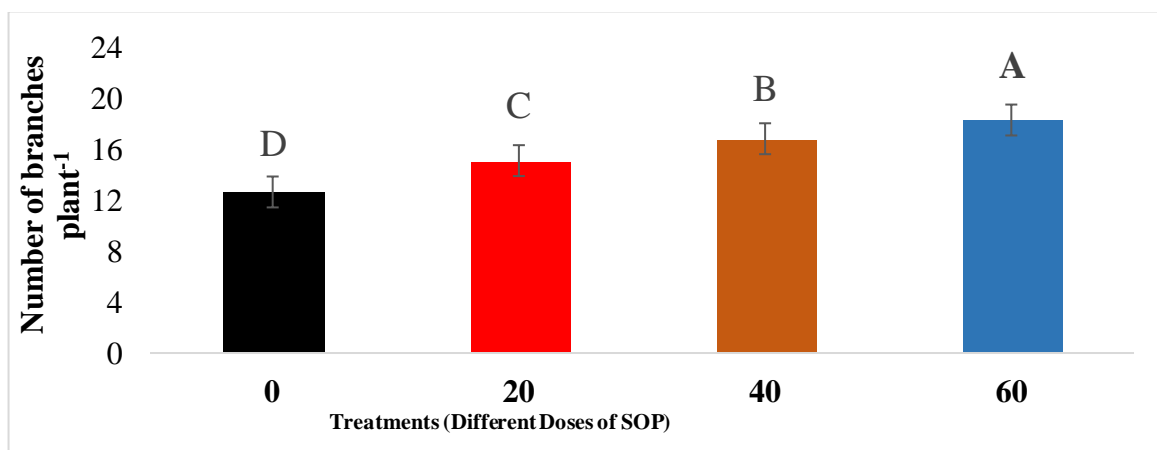


Fig. 2. Effect of different level of sulphate of potash ((T₁ = SOP = 0 g/kg (Control), T₂ = SOP = 20 g/kg, T₃ = SOP = 40 g/kg, T₄ = SOP = 60g/ kg) on sweet pepper Number of branches plant⁻¹ at (0.05)

PLANT HEIGHT (CM)

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was shown and the results to plant height (cm) of sweet pepper are given (Fig. 3). The findings was shows that the plant height at maturity was maximum (54.44 cm) $T_4 = \text{SOP} = 60 \text{ g/kg}$ was applied to the sweet pepper, followed by (49.50 cm) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The plant height at maturity of sweet pepper was further decreased to and 43.63 cm for sulphate of potash application @ $T_2 = \text{SOP} = 20 \text{ g/kg}$, respectively. Minimum (39.16 cm) plant height of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg ha}^{-1}$ is very helpful in achieving the maximum height of the plant at maturity. In comparison to the control treatment, the highest values for plant growth characters reported as plant height were obtained with 4 gm/L of K-humate and 4 ml/L of potassium oxide; the aforementioned results were same in both seasons (11).

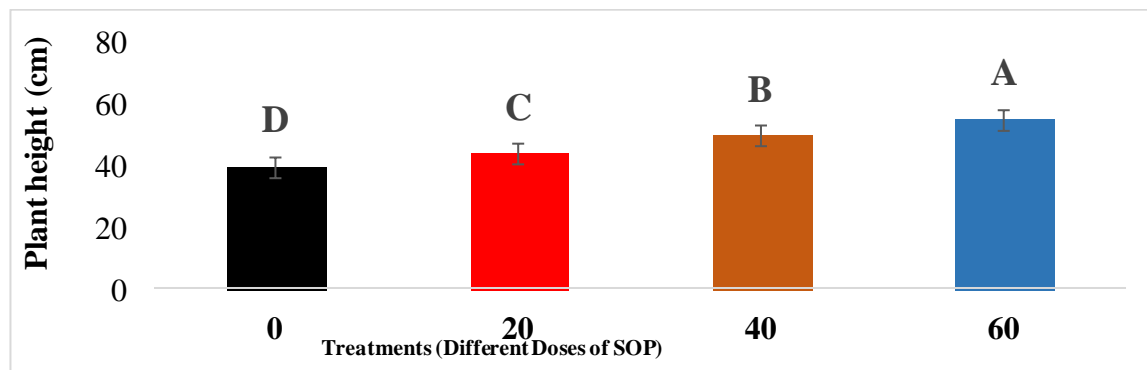


Fig. 3. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper plant height (cm) at (0.05)

DAYS TO 1st FLOWERING

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was investigated and the results to days to 1st flowering of sweet pepper are given in Fig. 4. The findings shows that the days to 1st flowering at maturity was maximum (40.12) when the sweet pepper was given application of $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), followed by (45.66) under sulphate of potash levels of $T_2 = \text{SOP} = 20 \text{ g/kg}$. The days to 1st flowering at maturity of sweet pepper was further decreased to and 49.76 for sulphate of potash application @ $T_3 = \text{SOP} = 40 \text{ g/kg}$, respectively. Minimum (52.34) days to 1st flowering of sweet pepper was observed with $T_4 = \text{SOP} = 60 \text{ g/kg}$. This indicates that the sulphate of potash fertilizer application of $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control) is highly beneficial for obtaining maximum days to 1st flowering at maturity. Sulfate of potash was used to speed up flowering days, while organic therapies were used to slow them down using SOP to initiate flowering, which took 30 to 35 days to achieve flowering stage (12).

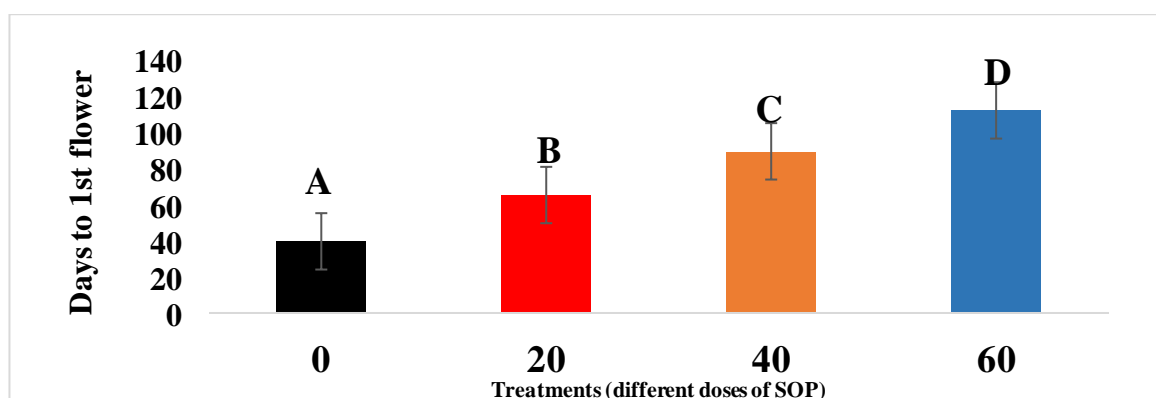


Fig. 4. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper Days to 1st flowering at (0.05)

FRUIT LENGTH (CM)

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was investigated and the results to fruit length (cm) of sweet pepper are given in Fig. 5. The results suggested that the fruit length at

maturity was maximum (12.34 cm) when the sweet pepper was given application of $T_4 = \text{SOP} = 60 \text{ g/kg}$, followed by (9.63 cm) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The fruit length at maturity of sweet pepper was further decreased to and 8.12 cm for sulphate of potash application @ $T_2 = \text{SOP} = 20 \text{ g/kg}$, respectively. Minimum (6.39 cm) fruit length of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg}$ is highly beneficial for obtaining maximum fruit length at maturity. In terms of fruit quality assessments (fruit length and average fruit weight), the results showed that as potassium levels increased from 50 to 200 kg/fed, there were notable improvements in sweet pepper fruit parameters (9).

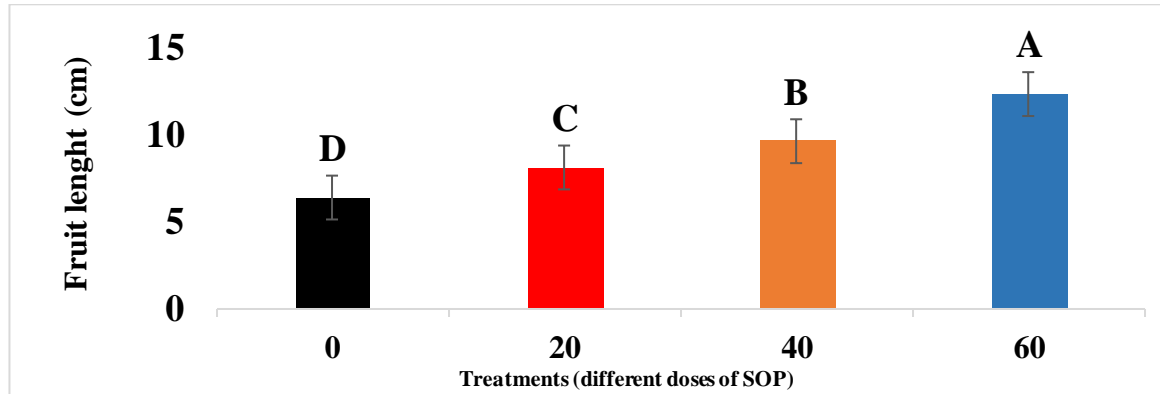


Fig. 5. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper fruit length (cm) at (0.05)

FRUIT DIAMETER (CM)

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was investigated and the results to fruit diameter (cm) of sweet pepper are given in Fig. 6. The results suggested that the fruit diameter at maturity was maximum (2.00 cm) when the sweet pepper was given application of $T_4 = \text{SOP} = 60 \text{ g/kg}$, followed by (1.59 cm) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The fruit diameter at maturity of sweet pepper was further decreased to and 1.36 cm for sulphate of potash application @ $T_2 = \text{SOP} = 20 \text{ g/kg}$, respectively. Minimum (1.08 cm) fruit diameter of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg}$ is highly beneficial for obtaining maximum fruit diameter at maturity. The data presented unambiguously showed that, with the exception of the average fruit diameter, there were substantial variations in the overall yield along with all fruit quality indicators (13).

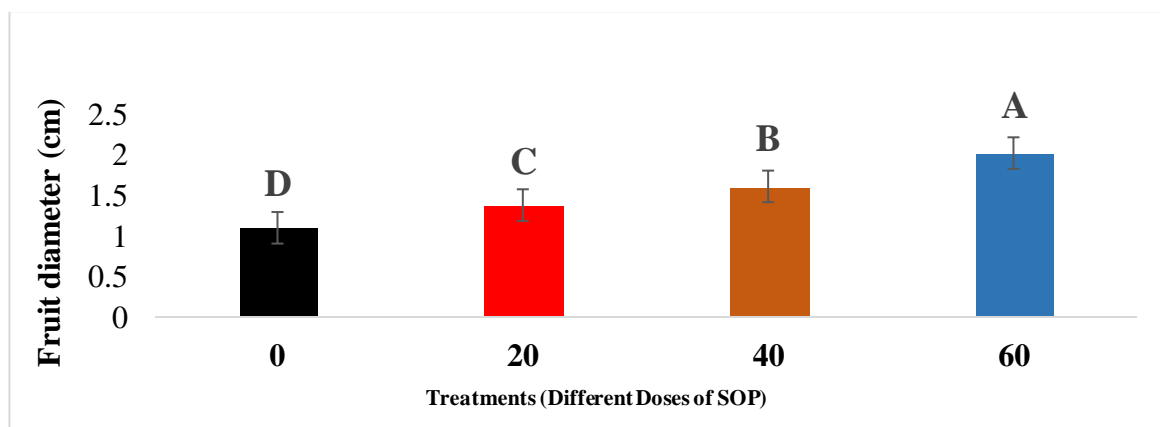


Fig. 6. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper fruit diameter (cm) at (0.05)

NUMBER OF FRUITS PLANT⁻¹

The effect of varying levels of sulphate of potash fertilizer in sweet papper was investigated and the results to number of fruits plant⁻¹ of sweet pepper are given in Fig. 7. The findings showed that the number of fruits plant⁻¹ at maturity was maximum (98.82) when the sweet pepper was given application of $T_4 = \text{SOP}$

= 60 g/kg, followed by (81.34) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The number of fruits plant⁻¹ at maturity of sweet pepper was further decreased to and 59.40 for sulphate of potash application @ $T_2 = \text{SOP} = 20 \text{ g/kg}$, respectively. Minimum (40.25) number of fruits plant⁻¹ of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg}$ is highly beneficial for obtaining maximum fruit diameter at maturity. A significant variation was observed in the number of fruits plant⁻¹ of sweet pepper when K fertilizers were applied at different doses. K2 (100 kg K ha⁻¹) produced the highest fruit number plant⁻¹, which was significantly distinct from K0 (70.7) treatment but compared favorably from K1 (75 kg K ha⁻¹) treatment. The K0 (control) treatment, which did not apply K fertilizers, produced the least fruit number plant⁻¹ (15) noticed improved potassium performance in irrigated sweet pepper.

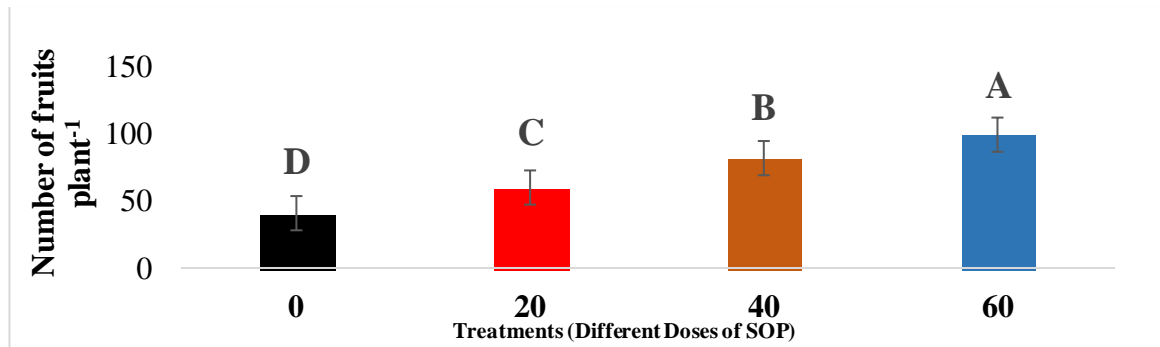


Fig. 7. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper Number of fruits plant⁻¹ at (0.05)

FRUIT YIELD PLANT⁻¹ (g)

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was investigated and the results to fruit yield Plant⁻¹ of sweet pepper are given in Fig. 8. The finding showed that the fruit yield plant⁻¹ at maturity was maximum (573.57 g) when the sweet pepper was given application of $T_4 = \text{SOP} = 60 \text{ g/kg}$, followed by (491.37 g) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The fruit yield plant⁻¹ at maturity of sweet pepper was further decreased to and 408.64 g for sulphate of potash application @ $T_2 = \text{SOP} = 20 \text{ g/kg}$, respectively. Minimum (353.64 g) fruit yield plant⁻¹ of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg}$ is highly beneficial for obtaining maximum fruit yield plant⁻¹ at maturity. Given its significant influence on fruit quality indicators, potassium is referred to as an essential nutrient and may have contributed to the reported results. They came to the conclusion that raising the potassium fertilization levels might also be employed to increase or improve fruit quality and plant yield (16).

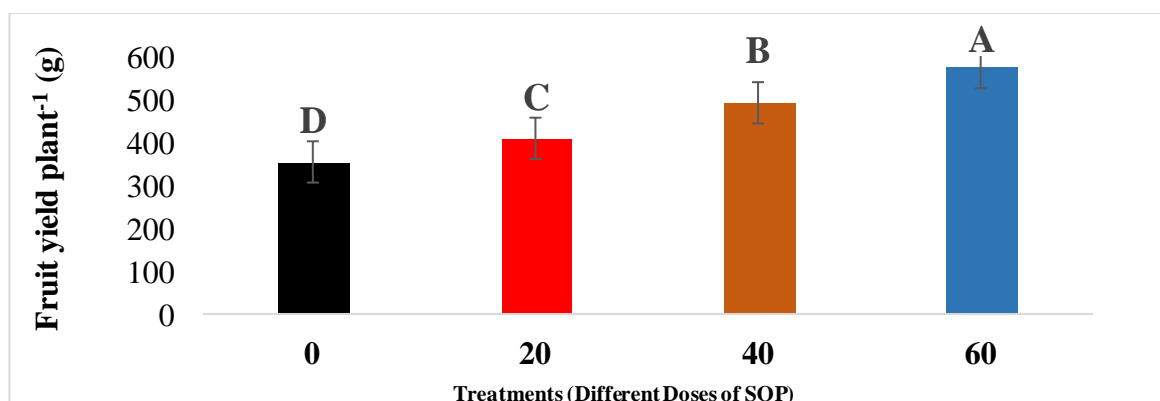


Fig. 8. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper fruit yield plant⁻¹ (g) at (0.05)

POTASSIUM CONTENT IN SOIL

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was investigated and the results to potassium content in soil of sweet pepper are given in Fig. 9. The results indicated that the potassium content in soil at maturity was maximum (78.7) when the sweet pepper was given application of

$T_4 = \text{SOP} = 60 \text{ g/kg}$, followed by (66.9) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The potassium content in soil at maturity of sweet pepper was further decreased to and (57.6) for sulphate of potash application @ $T_2 = \text{SOP} = 20 \text{ g/kg}$, respectively. Minimum (45.2) potassium content in soil of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg}$ is highly beneficial for obtaining maximum potassium content in soil at maturity. According to the findings, the SOP that was used enhanced the content over the control. The transformation of non-exchangeable K to exchangeable potassium in soils may be the cause of the rise in soil with higher K addition (17).

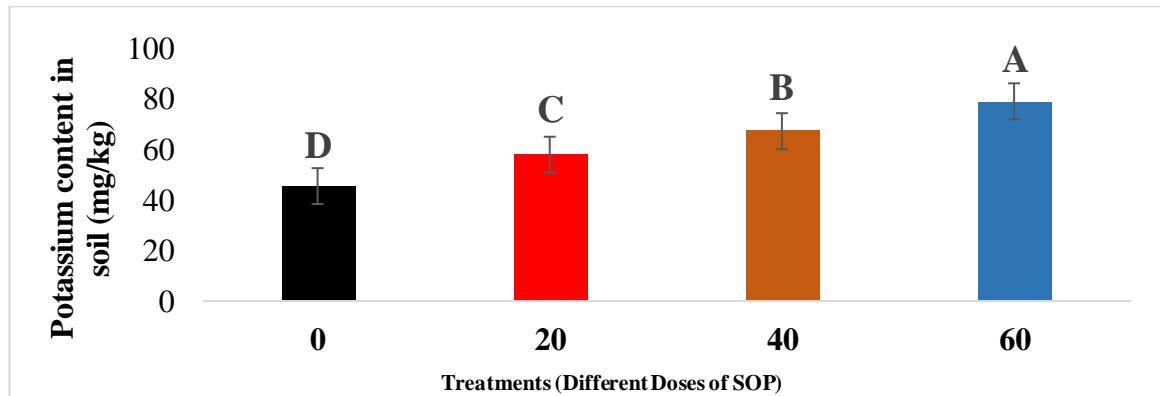


Fig. 9. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper potassium content in soil at (0.05)

POTASSIUM CONTENT IN PLANT

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was investigated and the results to potassium content in plant of sweet pepper are given in Fig. 10. The findings showed that the potassium content in plant at maturity was maximum (129.8) when the sweet pepper was given application of $T_4 = \text{SOP} = 60 \text{ g/kg}$, followed by (124.4) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The potassium content in plant at maturity of sweet pepper was further decreased to and (120.5) for sulphate of potash application @ $T_2 = \text{SOP} = 20 \text{ g/kg}$, respectively. Minimum (110.2) potassium content in plant of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg}$ is highly beneficial for obtaining maximum potassium content in plant at maturity. Increasing potassium fertilization rates from 50 to 200 kg/fed. Raising the rate of fertilization with potassium from 50 to 200 kg/fed. Greatly enhanced every chemical component, including the amount of vitamin C in fruits and the amount of N, P, and K in leaves as well as total chlorophyll. These findings might be explained by potassium's involvement in numerous critical plant regulatory systems as well as plant metabolism. Moreover, plants may absorb more minerals as a result (18).

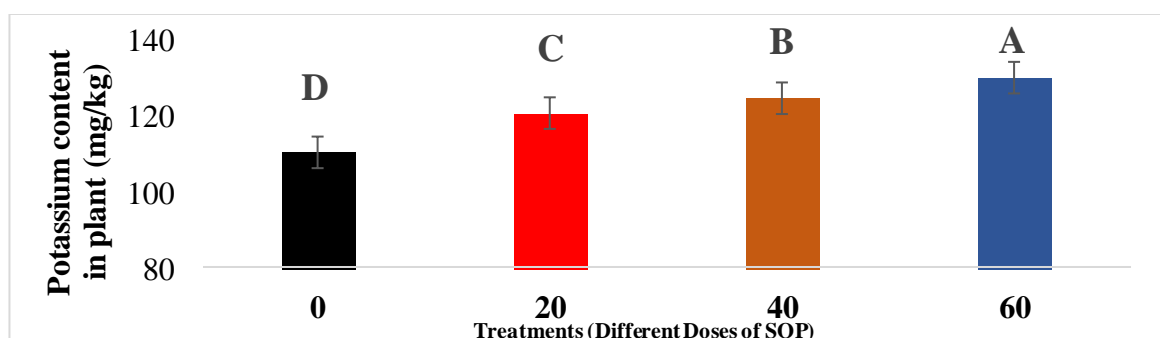


Fig. 10. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper potassium content in plant at (0.05)

SULPHATE CONTENT IN SOIL

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was investigated and the results to sulphate content in soil of sweet pepper are given in Fig. 11. The results indicated that the sulphate content in soil at maturity was maximum (15.00) when the sweet pepper was given application of $T_4 = \text{SOP} = 60 \text{ g/kg}$, followed by (13.62) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The sulphate content in

soil at maturity of sweet pepper was further decreased to and 10.82 for sulphate of potash application @ $T_2 = \text{SOP} = 60 \text{ g/kg}$, respectively. Minimum (7.47) sulphate content in soil of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg}$ is highly beneficial for obtaining maximum sulphate content in soil at maturity. Significant variation was observed in available sulphate in soil of sweet pepper field due to the application of different levels of K. There was highest available Sulphate in soil (17.02 ppm) was recorded from K1 (75 kg K ha^{-1}) which was statically dissimilar (14.88 ppm) with K2 (100 kg K ha^{-1}), on the contrary the lowest available S (12.35 ppm) was observed in K0 (Control) treatment (19).

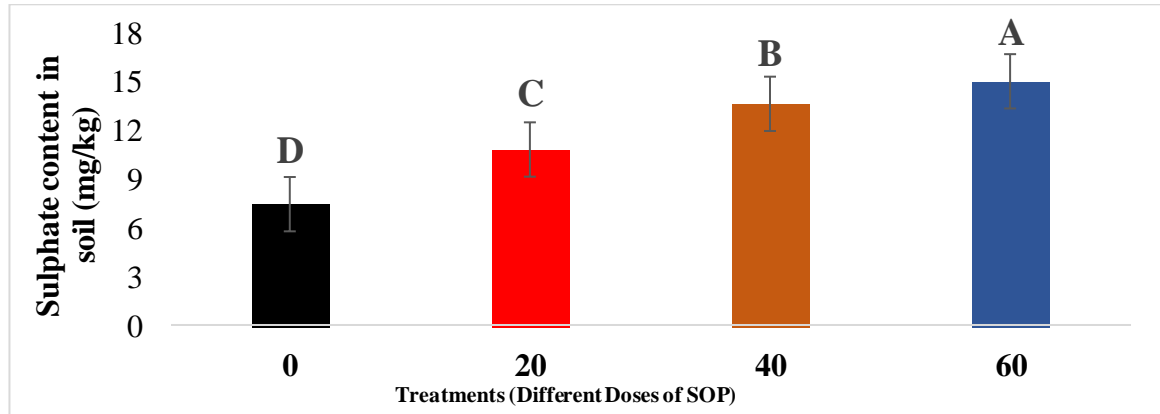


Fig. 11. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper sulphate content in soil at (0.05)

SULPHATE CONTENT IN PLANT

The effect of varying levels of sulphate of potash fertilizer in sweet pepper was investigated and the results to sulphate content in plant of sweet pepper are given in Fig. 12. The findings showed that the sulphate content in plant at maturity was maximum (11.52) when the sweet pepper was given application of $T_4 = \text{SOP} = 60 \text{ g/kg}$, followed by (9.87) under sulphate of potash levels of $T_3 = \text{SOP} = 40 \text{ g/kg}$. The sulphate content in plant at maturity of sweet pepper was further decreased to and 7.49 for sulphate of potash application @ $T_2 = \text{SOP} = 20 \text{ g/kg}$, respectively. Minimum (5.28) sulphate content in plant of sweet pepper was observed with $T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control). This indicates that the sulphate of potash fertilizer application of $T_4 = \text{SOP} = 60 \text{ g/kg}$ is highly beneficial for obtaining maximum sulphate content in plant at maturity. These findings may be attributed to the significance of sulphate content in plant, an element important in numerous metabolic processes and activities that support and encourage vegetative growth in plants. Furthermore, numerous research studies on sweet pepper (13) showed that sulphate is important for numerous biological and physiological processes, such as cell division and elongation and the metabolism of protein and carbohydrate molecules (20).

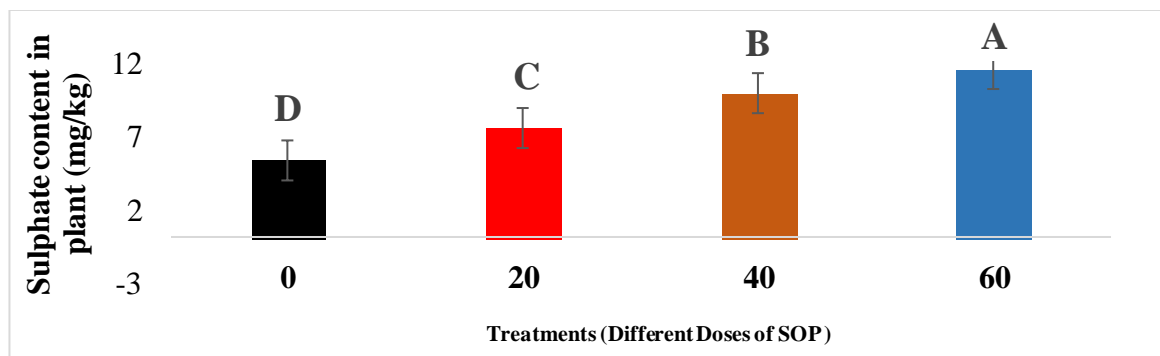


Fig. 12. Effect of different level of sulphate of potash ($T_1 = \text{SOP} = 0 \text{ g/kg}$ (Control), $T_2 = \text{SOP} = 20 \text{ g/kg}$, $T_3 = \text{SOP} = 40 \text{ g/kg}$, $T_4 = \text{SOP} = 60 \text{ g/kg}$) on sweet pepper sulphate content in plant at (0.05)

CONCLUSIONS

Based on the result obtained from the study, $T_4 = \text{SOP} = 60 \text{ g/kg}$ level showed superiority in terms of growth parameters and yield plant⁻¹. The study also concluded that neither low nor high potash of phosphate levels enhance the growth and yield of sweet pepper. You would use SOP that gave more

production of sweet pepper crop. The farmer should use SOP that will be beneficial and useful. This study focused on different levels of SOP and data showed significant results for the levels used in this experiment. The results elaborated the effect of 60 kg SOP for the best mean performance among plants. Based on dry and hot climate, 60 g/kg SOP can be used for sweet pepper for higher yield and production.

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