

# RESPONSE OF TWO EGGPLANTS HYBRID TO SEAWEED EXTRACT AND PLASTIC MULCHING ON YIELD AND ITS CHARACTERISTICS IN OPEN FIELD

**Dr. ABDULJEBBAR I. SAEID**

College of Agricultural engineering sciences / University of Duhok/ Iraq.

Corresponding Author Email: abduljabbar.saeid@uod.ac

## Abstract:

The experiment was carried out at the Malta Station Research Farm in Duhok. During the 2019 growing season to investigate the impact of eggplants hybrid to seaweed extract and plastic mulching with two hybrid eggplants (Anomoro and Vivo), as well as three types of plastic mulch (Black, Clear, and bare soil) and three levels of sea weed 0 ml.L-1, 30 ml.L-1, and 60 ml.L-1 respectively, on Yields and its chemical characteristics of eggplants. The collected data result in a considerable increase in the majority of the examined parameters. Vivo hybrid increased Yield; Carbohydrate, protein and potassium, while, Anamoro gave the highest value of nitro gen concentration. However about mulching factors gave a good result at black plastic mulch (Chlorophyll, Yield; Carbohydrate, protein) and clear mulch improved N,P,K. Seaweed fertilizer at 60 ml.L-1 increased all parameters which were studied in this research (Chlorophyll, Yield; Carbohydrate, P,K). At high concentrations, the interaction of three examined components resulted in the maximum values of all parameters.

**Keywords:** Eggplant content, protein, carbohydrate.

## INTRODUCTION:

Eggplant (*Solanum melongena* L.) is a popular vegetable grown in tropical and subtropical climates, as well as certain temperate climates. [1]. Aubergine is another name it's know by. *Solanum* species (eggplants) are a part of the Solanaceae family and the genus *Solanum*, in over 1,000 species are included worldwide [2]. Eggplant is considered to be a perennial plant, grown as an annual crop in the temperate area. The nightshade family includes this species [3]. Eggplants that come in a range of forms, colours, and sizes as well as being free of flaws, all of which are vital characteristics for the eggplant fruit's exterior [4]. Eggplants for human consumption provide a protein content of 1.4 grams, 40 grams of carbohydrates, 2 milligrams of vitamin C, and 40 grams of fibre. Composition that is beneficial to the health of humans. They're high in potassium, magnesium, calcium, and iron [5]. Evolution of environments can be enhanced by using artificial mulches. There are useful result on soil moisture and temperature as well as on biological lifespan in the earth was remarked by [6, 7, and 8]. Polyethylene plastic mulch is commonly utilized in agricultural production because it suppresses weeds, conserves soil moisture, and raises soil warmth. Researchers reported better yields when they used black plastic instead of bare soil [9,10]. Plastic mulches have a number of advantages in specific situations, including higher crop maturity, improved the quality of harvest, enhanced weed control, reduced soil evapotranspiration, and greater crop production. Several researchers have looked at the impact of black polyethylene on soil parameters and agricultural yield [11, 12, 13,

14].The seaweed materials promote seed germination, seedling invasion, plant tolerance to natural stressors [15] and plant development and yield, because of the existence of large levels of organic matter, seaweed liquid fertilizers were shown to be superior to synthetic fertilizers, resulting in a cost reduction of half for chemical fertilizers [16]. Nutrient Seaweed extract is one of the current resources used to increase the amount of agricultural production without using biological stimulants, which has its own set of problems in terms of health and environmental contamination. Another known fact is that foliar submission has a quick effect on providing plants with their supplies. Encouraging results were obtained with seaweed, which has had a significant influence in motivating the physiological processes that lead to increased plant growth [17] One of the most important marine resources on the planet are seaweeds, and they are used as human food, animal feed, and raw material in some industries. They are also used as agricultural manure. As well as horticultural crops [18] Hybrid selection is one of the most important choices that a farmer should make at any certain time. Before choosing an eggplant hybrid for marketable production, make sure there is a market request for that particular type of eggplant. Some consumers prefer specific colours forms, and dimensions of eggplants.

#### **MATERIALS AND METHODS:**

During the 2019 growing season, the experiment was carried out at the Malta Station Research Farm in Duhok, Iraq. The research area spanned 500 square meters soil analysis, presented in table (1). The common culture practices was prepared in soil. The system of drip irrigation was installed .The area was divided in row 80 cm width and 440 cm length, total area for 1 unit was 3.52m,<sup>2</sup> the distant between plants 40 cm and line 80 cm. Field research was conducted in factorial experiments using a split-split plot design in (RCBD) with three replications. In the main plot, hybrids were spread, seaweed treatment was set up in the sub plots, and plastic mulch was used in the sub – sub plots. Three varieties of plastic mulch (Black, Clear, and bare soil) and three amounts of sea weed (Maxi Grow) 0.0 ml.L<sup>-1</sup>, 30 ml.L<sup>-1</sup>, and 60 ml.L<sup>-1</sup>, were utilized, as well as two hybrid eggplants (Anomoro and Vivo). 2x3x3 = 18 Mulching was done prior to planting, and seaweed spraying was done three times in fifteen days commencing after the fourth true leaf stage. The SAS application was used to analyse the data. Duncan's multiple range test was used to compare mean values at the 0.05 or 5% [19]

Five plants were chosen at random from each experimental group for data collection. Data was obtained on yield, and its character parameters.

**Table (1): Some physical and chemical characteristics of the soil in the land experiment.**

Characteristics	Measuring units	2019
<b>Volumetric distribution of soil separate</b>		
Sand	(%)	50.9
Silt	(%)	22.5
Clay	(%)	26.6
Texture	---	Sandy clay loam
<b>Available nutrient content</b>		
Total -N	(%)	1.652
Available phosphorus	(%)	0.0297
Available potassium	Ppm	1.461
Organic matter	(%)	1.942
PH	1:1 in peste	7.04
Electrical conductivity	(ds.m <sup>-1</sup> )	0.178

\*The analysis was carried out at soil and water science laboratory, College of Agricultural engineering Sciences University of Duhok.

#### **Experimental Measurement:**

**Total Chlorophyll in Leaves %:** The Chlorophyll content in leaves was measured by using (Chlorophyll Meter, model SPAD – 502, Konic Minolta), after two month from planting.

**Total yield (ton/ha):** All fruits in each m<sup>2</sup> of experimental area were multiplied by 10000 to calculate the total yield t/ha.

**Carbohydrate content in fruit:** The percentage of total carbohydrate measured in fruits according to the method presented by [20].

**Protein content (%):** The percentage of protein was measured in fruits, Nitrogen percentage multiplied by 6.25 [21].

#### **Mineral nutrients concentration in leaves**

**Nitrogen % in leaves:** Nitrogen percentage was determined according to Kjeldahl modified method using Microkjeldahl instrument [22]

**Phosphorus % in leaves:** The phosphorus percentage was evaluated according to colorimetric method by using spectrometer [23]

**Potassium % in leaves:** Potassium percentage was determined according to flame method using flame photometer instrument [24]

All mineral analysis were carried out at the College of Agricultural engineering Sciences University of Duhok laboratory.

**Chlorophyll content in leaves (SPAD):** Data in table (2) shows effect of spraying by seaweeds extract and plastic mulching on chlorophyll content in leaves of two eggplant hybrids, the table confirmed no significant variation between hybrids. Regarding the

effect of mulching on chlorophyll in leaves, remarked significant difference, the clear mulch 64.49 was superior compared by no mulching 61.01. About the interaction between hybrid and mulching remarked significant variance at clear mulch with 65.70 in Vivo hybrid compared with no mulching in a same hybrid 60.41. Regarding the collaboration between hybrids and seaweed shower significant change in Vivo hybrid 64.29 compared by Anamoro 61.29 at rate of zero seaweed. Concerning the interaction between mulching and seaweed extract stated a significant difference among mulching and seaweed extract. The black mulch at rate of 60 ml.L<sup>-1</sup> 64.87 compared with out mulch in Vivo hybrid same level of zero seaweed 60.30. About the interaction among three factor observer significant difference regarding the chlorophylls content, at black mulch in Vivo hybrid at level of 60 ml.L<sup>-1</sup> 66.97 compared without mulch at zero level of mulching 59.17%.

**Table (2): Influence of Seaweed Extract and mulching on leaf chlorophyll (SPAD) of two Eggplant hybrids**

Hybrid	Mulching	Seaweed			Hybrids*mulch	Hybrids
		0 ml.L <sup>-1</sup>	30 ml.L <sup>-1</sup>	60 ml.L <sup>-1</sup>		
Anamoro	Without	61.43 c-e	62.57 b-e	61.83 c-e	61.61 cd	62.45 a
	Clear	61.03 a-c	63.70 b-e	65.13 c-e	63.29 bc	
	Black	60.40 b-e	63.90 c-e	63.07 b-e	62.46 cd	
Vivo	Without	59.17 e	59.83 de	62.23 b-e	60.41 d	62.56 a
	Clear	62.00 b	64.13 b-d	63.97 b-d	62.45 b	
	Black	63.03 b-e	64.77 bc	66.97 a	64.82 a	
Seaweed		61.01 c	62.65 a	63.78 a	Mulching	
Hybrids* seaweed.	Anomoro	61.29 ab	62.39 ab	63.68 b		
	Vivo	63.73 ab	62.91 ab	64.29 a		
Mulch* seaweed.	Without	60.30 d	61.20 cd	61.53 cd	61.01 c	
	Clear	61.02 cd	63.92 bc	64.55 ab	62.87 b	
	Black	62.22 b-d	62.83 b-d	64.87 a	63.64 a	

The mean with a column, row, and their interaction following with the same latter are not statistically different, according to Duncan multiple at the 0.05 level.

**Yield (ton/ha<sup>-1</sup>)** Table (3) illustrated impact of seaweed, plastic mulch on yield ton.ha<sup>-1</sup> of eggplant hybrid, there are significant variances among hybrids, hybrid Vivo 77.09 ton/ha triumph over to Anomoro hybrid 74.91 ton.hectare<sup>-1</sup>. The impact of seaweed on yield ton.hectare<sup>-1</sup> there have been significant adjustments concerning the rate of seaweed utility at 60ml/l 80.74 as compared with zero treatment 71.43. Regarding the impact of mulching on yield, there great variations amongst plastic mulch, black mulch with 82.82 ton.ha<sup>-1</sup> as compared with out mulch 65.34 ton

**Table (3): Influence of Seaweed Extract and Mulching on yield ton/ha of two Eggplants hybrid.**

Hybrids	Mulching	Seaweed			Hybrids*mulch	Hybrids
		0 ml.L <sup>-1</sup>	30 ml.L <sup>-1</sup>	60 ml.L <sup>-1</sup>		
Anomoro	Without	59.53 f	61.37 b-f	76.37 ef	65.76 c	74.91 b
	Clear	74.60 b-f	78.60 a-e	80.17 a-d	77.79 b	
	Black	76.21 a-e	78.20 d-f	84.17 bc	80.86 b	
Vivo	Without	61.97 ef	65.10 c-f	66.70 ef	64.92 d	77..09 a
	Clear	80.57 a-d	85.10 b	88.97 ab	84.54 a	
	Black	80.70 a-d	84.60 bc	90.07 a	84.79 a	
Sea weed.		71.43 c	75.33 b	80.74 a	Mulching	
Hybrids* sea weed.	Anomoro	60.11 b	64.39 ab	71.23 ab		
	Vivo	77.74 ab	81.27 ab	84.24 a		
Mulch* sea weed.	Without	60.75 c	63.73 b	70.53 c	65.34 b	
	Clear	77.58 ab	81.85 a	84.24 a	80.33 b	
	Black	78.95 ab	81.40 bc	85.12 a	82.82 a	

The mean with a column, row, and their interaction following with the same latter are not statistically different, according to Duncan multiple at the 0.05 level.

The interaction between hybrids and mulching, there has been a large variance between hybrids and plastic mulch colour, hybrid Vivo with black mulch were significant 84.79 ton/ta in comparison with an identical hybrid without mulch 64.92 ton. There were significant differences in the interaction between hybrids and the level seaweed, with hybrid Vivo at a rate of 60ml. In comparison to Anomoro at a level of 0 ml, L-1 has 84.24 ton.ha-1. 60.75 ton.h-1 L-1. A significant influence on supra yield t/h was noted due to the collaboration of seaweed concentration and mulching, with the best result obtained at a level of 60ml. L-1 in black mulch compared to no mulch and no seaweed was 82.82 t/h and 60.75 t/h, respectively. In terms of the interaction of three factors, hybrid Vivo with black mulch at a concentration of 60ml. L-1 90.07 t/h was significantly different from Anomoro hybrid with no mulch in a of seaweed rate of 59.53 t/h it increased by 38.03%.

### Carbohydrate content in Fruits%:

Table (4) illustrated high variation between both hybrids on carbohydrate in eggplant fruits, hybrid Anamoro 15.47 % carbohydrate in fruits compared with Vivo hybrid 14.59%,. The effect of mulching in carbohydrate% in fruits, remarked substantial difference among plastic mulch on carbohydrate content, the black plastic mulch overcome 17.9% to no mulching 13.3%.

Result in the same table show consequence of foliar application by sea weed extract, significant variety among rate of sea weed at level of 60 ml.L<sup>-1</sup> gave highest value 16.5% carbohydrate compared with no sea weed applicator at zero level 13.8%.

The combination between hybrids and plastic mulching, had a significant variance, hybrid Anamoro provided highest value in black mulch 19.1% compared with no mulching in both hybrids 13.3%. About the interaction between hybrids and sea weed, a substantial variance was observed, hybrid Anamoro gave highest value 17.2% compared with Vivo hybrid 13.1%.

Regarding the interaction between mulching and sea weed remarked significant differences. The black mulch gave 19.3% carbohydrate at level of 60 ml.L<sup>-1</sup> compared with clear mulch at rate of zero ml.L<sup>-1</sup> 12.9%,. The triple interaction among hybrid, mulching and sea weed extract observer substantial variance, in the black cover at rate of 60 ml.L<sup>-1</sup> obtained highest value 21. % carbohydrate in Anamoro hybrid compared by 12.1. % in a level 30 ml.L<sup>-1</sup> of sea weed extract in same hybrid.

**Table (4) Influence of Seaweed Extract and mulching by on Carbohydrate in fruits% of two Eggplant hybrid.**

Hybrid	Mulching	Seaweed			Hybrids*mulch	Hybrids
		0 ml.L <sup>-1</sup>	30 ml.L <sup>-1</sup>	60 ml.L <sup>-1</sup>		
Anamoro	Without	12.9 f-h	12.1 gh	14.8 e-g	13.3 c	15.47 a
	Clear	12.5 f-h	13.6 g-i	15.9 ef	14.0 bc	
	Black	17.1 de	19.1 cd	21.0 a	19.1 a	
Vivo	Without	12.6 f-h	13.9 g-i	14.2 hi	13.57c	14.59b
	Clear	13.3 g-i	14.3 hi	15.6 hi	14.4 bc	
	Black	14.4e-g	15.4 ef	17.6 d e	15.8b	
Seaweed		13.8 c	14.7 b	16.5 a	Mulching	
Hybrids* seaweed.	anamoro	13.2 c	14.0 b	17.2 a		
	Vivo	13.1c	14.2 b	16.5 ab		
Mulch* seaweed.	Without	13.3 d	13.0 c	14.5 cd	13.3 c	
	Clear	12.9 d	14.0 cd	15.3 c	14.4 b	
	Black	15.7 c	17.8 b	19.3 a	17.9 a	

The mean with a column, row, and their interaction following with the same latter are not statistically different, according to Duncan multiple at the 0.05 level.

### Protein content%

Data in table (5) indicated effect of foliar seaweed extract application and plastic mulching on protein content in fruits at two eggplant hybrids, result show significant variance between hybrids, Vivo19.31% compared with Anamoro hybrid 16.89%. Regarding effect of mulching on protein content fruit, remarked substantial effect, black mulching was 19.75% comparative by bare soil 16.54%. About influence of seaweed application.

Seaweed significantly affected on protein contented in fruits, at level of 60 ml.L<sup>-1</sup> was 19.41% compare with rate of zero ml.L<sup>-1</sup>, 16.39%..

**Table (5): Influence of Seaweed Extract and mulching on protein in fruits% of two Eggplants hybrid.**

Hybrid	Mulching	Seaweed			Hybrid*Mulching	Hybrids
		0 ml.L <sup>-1</sup>	30 ml.L <sup>-1</sup>	60 ml.L <sup>-1</sup>		
Anamoro	Without	13.23 h	14.73 gh	15.46 f-h	14.47 c	16.89 b
	Clear	16.60 d-h	18.54 a-f	19.54 a-e	18.23 b	
	Black	16.67 d-h	17.67 b-g	19.54 a-e	17.96 bc	
Vivo	Without	17.08 c-g	18.00 b-g	20.75 a-c	18.61 a	19.31 a
	Clear	18.52 a-f	19.67 a-e	20.17 a-d	19.45 b	
	Black	19.23 e-h	21.31 ab	22.02 a	20.85 a	
Seaweed		16.39 a-e	18.49 a	19.41 a	Mulching	
Hybrids* seaweed.	Anamoro	15.50 d	17.31 cd	17.85 bc		
	Vivo	17.28 cd	19.66 ab	20.98 a		
Mulch* seaweed.	Without	15.16 d	16.86 cd	17.60 b-d	16.54 c	
	Clear	17.56 b-d	19.10 a-c	19.85 ab	18.84 b	
	Black	17.45 c d	19.49 ab	20.78 a	19.73 a	

The mean with a column, row, and their interaction following with the same latter are not statistically different, according to Duncan multiple at the 0.05 level.

In case of binary interaction between hybrids and mulching a supra protein content in eggplant fruits, observer significant variation hybrid Vivo provide 20.85% with black mulching compared with Anamoro hybrid in bare soil 14.47%..

About the collaboration between hybrids and seaweed extract foliar application on protein content in fruits, remarked substantial difference, in protein hybrid Vivo in level of 60 ml.L<sup>-1</sup> gave 20.98% compare with Anamoro hybrid 15.50% in rate of zero ml.L<sup>-1</sup> seaweed extract.

Regarding the interaction between seaweed extract and mulching on protein contented witness that application of seaweed extract at level of 60 ml.L<sup>-1</sup> showed significant variance gave 20.78% protein in fruits compered by the same mulching color 15.16%.

The interaction among all three factors indicated substantial difference among three aspect, hybrid Vivo provided 22.02% protein at level of 60 ml.L<sup>-1</sup> in black mulch compared by Anamoro hybrid with 13.23%, at rate of zero ml.L<sup>-1</sup> .

### Nitrogen in leaves%

Data presented in table (6) reported nitrogen content in eggplants leaves, results indicated significant difference between two hybrids, hybrid Vivo 2.48 compared by Anamoro hybrid 2.14%. Mulching had substantial variance among type of mulching a supra Nitrogen content in leaves, Clear mulch 2.33% compared with black mulch 2.27%. Seaweed extract had no substantial difference on Nitrogen content in leaves, at level of 60 ml.L<sup>-1</sup> 2.39% compared by untreated with 2.24%.

Binary Interaction between hybrids and mulching indicated significant variance, Vivo hybrid 2.48% with black mulching overcome Anamoro hybrid 2.14%.

The relating among hybrids and foliar application with sea weed extract to nitrogen content in leaves, no substantial difference related hybrid and mulching only hybrid Vivo 2.39% at level of 30 ml.L<sup>-1</sup> sea weed was superior to anamoro hybrid 2.19% without treatment.

The relating among hybrids and foliar application with sea weed extract to nitrogen content in leaves, are substantial difference hybrid Vivo with 2.39% at level of 30 ml.L<sup>-1</sup> compared by Anamoro hybrid 2.19 at level of zero ml.L<sup>-1</sup>. Related the collaboration between mulching and seaweed, a significant modification was observed at level of 30 ml.L<sup>-1</sup> in cleae mulch 2.43% compared by black mulch 2.12% at zero treatment.

**Table (6) Influence of Seaweed Extract and mulching on Nitrogen in leaves% of two Eggplants hybrid.**

Hybrid	Mulch	Seaweed			Hybrids*mulch	Hybrids
		0 ml.L <sup>-1</sup>	30 ml.L <sup>-1</sup>	60 ml.L <sup>-1</sup>		
Anamoro	Without	2.27 a-c	2.27 a-c	2.27 a-c	2.27 ab	2.25 a
	Clear	2.27 a-c	2.30 a -c	2.47 ab	2.34 ab	
	Black	2.03 bc	2.20 a-c	2.20 a-c	2.14 b	
Vivo	Without	2.23 a-c	2.27 a-c	2.37 a-c	2.29 ab	2.32 a
	Clear	2.43 ab	2.40 a-c	2.48 c	2.43 ab	
	Black	2.40 a-c	2.50 ab	2.53 a	2.48 a	
Seaweed		2.24 b	2.35 a	2.39 a	Mulching	
Hybrids* seaweed.	Anamoro	2.19 b	2.31 a	2.26 a		
	Vivo	2.29 a	2.39 a	2.28 a		
Mulch* seaweed.	Without	2.25 c	2.27 c	2.32 a	2.28 b	
	Clear	2.35 ab	2.43 a	2.21 b	2.33 a	
	Black	2.12 b	2.35 ab	2.37 ab	2.27 b	

The mean with a column, row, and their interaction following with the same latter are not statistically different, according to Duncan multiple at the 0.05 level.

The interaction of three factors indicated significant variance among all factors, the highest result recorded in a Vivo hybrid 2.53% at level of 60 ml.L<sup>-1</sup> in black mulching in comparison with Anamoro hybrid 2.03% in a rate of zero ml.L<sup>-1</sup> seaweed extract covered with a black mulch.

### Phosphorous percentage in leaves (%):

Table (7) indicated substantial difference between hybrids in phosphorous content (%) hybrid Anamoro content 0.065% comparative with Vivo hybrid 0.056%. Result of mulching in content of phosphorous, no significant difference was observed among plastic colour on content of phosphorous in leaves. About the effect of seaweed on phosphorous contented showed a significant variance between level of seaweed at 60 ml.L<sup>-1</sup> 0.061% compared with by zero 0.046%

Combination between hybrids and mulching, remarked significant variance in phosphorous content in eggplant leaves, Vivo hybrid with clear mulch 0.059% compared by the Anamoro hybrid at black mulching 0.049%. Binary interaction between



sea weed and hybrids indicated substantial variation in phosphorous contented in leaves Anamoro hybrid gave 0.062% at level of 60 ml.L<sup>-1</sup> as compared by a same hybrid at level of zero ml.L<sup>-1</sup> 0.041. Collaboration between mulching and sea weed, observed significant variance, on leaves content in phosphorous, highest value obtained in rate of 60 ml.L<sup>-1</sup> were 0.065% without mulch in comparison with the same mulch colour at level of zero ml.L<sup>-1</sup> was 0.040%.

**Table (7): Influence of mulching and Seaweed Extract on Phosphorus in leaves% of two Eggplant hybrid.**

Hybrid	Mulch	Seaweed Extract			Hybrids*mulch	Hybrids
		0 ml.L <sup>-1</sup>	30 ml.L <sup>-1</sup>	60 ml.L <sup>-1</sup>		
Anamoro	Without	0.0.031 d	0.047 bc	0.072 a	0.050 b	0.065 a
	Clear	0.049 bc	0.0.49 bc	0.055 b	0.051 a	
	Black	0.0.43 bc	0.051 bc	0.054 c	0.049 b	
Vivo	Without	0.049 b	0.056 b	0.058 b	0.055 a	0.056 b
	Clear	0.057 b	0.058 b	0.061 b	0.059 a	
	Black	0.045 bc	0.052 b	0.066 a	0.054 a	
Sea weed		0.046 c	0.052 b	0.061 a	Mulching	
Sea weed*hybrid	anamoro	0.041 c	0.049 b	0.062 a		
	Vivo	0.050 b	0.055 b	0.061 a		
Mulch*sea weed	Without	0.040 ab	0.052 ab	0.065 a	0.052 a	
	Clear	0.053 ab	0.054 ab	0.059 a	0.055 a	
	Black	0.044 c	0.052 ab	0.063 a	0.053 a	

The mean with a column, row, and their interaction following with the same latter are not statistically different, according to Duncan multiple at the 0.05 level.

The triple interaction among all factors showed a substantial difference in eggplant leaves phosphorous content highest charge was proved at level of 60 ml.L<sup>-1</sup> in anamoro hybrid 0.072% without mulch in comparison with the same hybrid at rate of zero ml.L<sup>-1</sup> were 0.040% without mulch.

**Potassium percentage in leaves (%):**

Data in table (8) illustrated the presence of potassium in two hybrids of eggplants leave, the hybrid Vivo was significant overcome Anamoro hybrid 1.47% respective 1.44%. The result of mulching was significant different, black mulching gave 1.52% compared without mulch 1.39%. About the effect of seaweed a supra leaves content of potassium a significant difference was noted among level of foliar application by seaweed at a level of 60 ml.L<sup>-1</sup> was 1.53% compared with zero seaweed 1.36%.

The binary interaction between hybrids and mulching the above table hybrid Vivo revealed a significant variance 1.54% in black mulch compared without hybrid without mulch 1.36%. The interaction between hybrids and seaweed had a significant variation, Vivo hybrid at level of 60 ml.L<sup>-1</sup> showed highest potassium 1.54% in leaves compared with Anamoro hybrid 1.41%. The interaction between seaweed and mulching on

potassium content had substantial variance 1.58% at black mulch at the level of 60 ml.L<sup>-1</sup> sea weed extract compare with 1.26% with no mulch at the level of zero ml.L<sup>-1</sup>.

The triple interaction among all three factors, they are high significant, best result was achieved in in Vivo hybrid, at level of 60 ml.L<sup>-1</sup> in black mulching 1.64% compared to with no mulch at level of zero ml.L<sup>-1</sup> in Anamoro hybrid 1.25%..

**Table (8): Influence of Seaweed Extract and mulching on Potassium content in leaves% of two Eggplants hybrid.**

Hybrids	Mulching	Seaweed.			Hybrids*mulch	Hybrids
		0 ml.L <sup>-1</sup>	30 ml.L <sup>-1</sup>	60 ml.L <sup>-1</sup>		
Anamoro	Without	1.25 g-i	1.36 fg	1.46 d-f	1.36 c	1.44 b
	Clear	1.48 b-g	1.53 a-e	1.43 c-h	1.48 bc	
	Black	1.46 df	1.48 cd	1.52 b-c	1.49 bc	
Vivo	Without	1.27 g-i	1.47 cd	1.50 c	1.41 b	1.47 a
	Clear	1.32 f-i	1.49 cd	1.55bc	1.45 b	
	Black	1.43 a-c	1.54 bc	1.64 a	1.54 a	
Seaweed.		1.36 c	1.47 b	1.53 a	Mulching	
Hybrids*seaweed.	Anamoro	1.38 c	1.44 b	1.50 b		
	Vivo	1.34 cd	1.50 b	1.56 a		
Mulch*seaweed.	Without	1.26 d	1.42 c	1.48 bc	1.39 b	
	Clear	1.38 bc	1.49 bc	1.54 d	1.47 a	
	Black	1.45 bc	1.51 b	1.58 a	1.52 a	

The mean with a column, row, and their interaction following with the same latter are not statistically different, according to Duncan multiple at the 0.05 level.

## DISCUSSION:

The effect of different plastic mulch and organic fertilizers and their interaction on N, P and K contents of eggplant are presented in Table (6,7,8 ) Data reveal that plastic mulch treatment affected positive N, P and K contents. The highest value was occurred using transparent mulch treatment. Bare soil gave the highest value of nitrogen, phosphorous in eggplant leaves about the potassium content in black mulch was superior 1.52%. These results may be due to that using plastic mulch decrease the evaporation rate from soil surface and led to increase the soil moisture content which enhances the uptake of potassium as shown in table (8). These results are similar to the ones found by [25]

Our results are compatible with [26] who reported that the spraying different doses of seaweed extracts on tomato significantly improved tomato yield by 4.6-6.9% compared with control. Moreover, they attributed this increment of yield and quality characters to the positive biological stimulation of seaweed extracts on the photosynthetic capability enhancement of tomato leaves.

In the present study, the presentation of the seaweed extract improved the yield of eggplant

Numerous studies also confirmed that leaf chlorophyll content positively increased with the application of seaweed extract, which exactly accorded with our results.

The results shows that all factors studied (hybrids, seaweed extract and mulching) and their communication is substantial in most character studied (table 2, 3, 4, 6, 7, 8,) dry weight, chlorophyll, yield/ha, protein, N, P, K.

Vivo hybrid noted that gave highest value compared with Anamoro hybrid, this difference may be due to difference of root system and absorption of nutrient element, even variance in genotype between hybrids a same effect was stated by [27].

## CONCLUSION:

In this study seaweed and plastic mulch had higher influence in the yield and accumulation of nutritive compounds. The highest yields were obtained in hybrid Vivo along with the highest contents of the compounds in eggplant. Plastic mulch and seaweed had a positive effect in all parameter studied in this investigation.

## Reference:

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