Eggplant is a perennial plant but full-grown commercially as an annual produce. The specie belongs nightshade family (Solanaceae) and Solanum melongena, by over 1,000 species worldwide (Agoreyo et al., 2012).

Eggplant is a perennial plant but full-grown commercially as an annual produce. The specie belongs nightshade family (Solanaceae) and Solanum melongena, by over 1,000 species worldwide (Agoreyo et al., 2012).

INTRODUCTION

Researchers using black plastic instead of bare soil have reported higher yields (Brown J. E. and C. Butcher 1999).

In some circumstance, plastic mulches have many advantages such as increased earlier maturing of crops, harvests quality, improved weed control, reduces evapotranspiration from the soil and enhance crop yield. The effect of black polyethylene on soil properties and crop yield has been studied by several workers (Miyasaka et al., 2001; Moreno and Moreno, 2008; Oñate and Peco, 2005; Hatimi, S.; A. Nourjou; M. Henareh and L. Pourakbar (2012)).

The seaweed items improve seeds germination, seedlings encroachment, increment plant resistance to natural stresses (Zhang, X.; E. H. Ervin and R. E. Schmidt (2003)) and improve plant development and yield. Seaweed liquid fertilizers were found superior to the synthetic one due to the presence of high levels of organic matter, therefore accounting a decrease of half expense for chemical fertilizer (Aitken and Senn 1965). Seaweeds are one of the most significant marine resources of the world and being utilized as human nourishment, animal feed and raw material for some industries, they are additionally utilized manure for agricultural and horticultural crops (Chapman and Chapman 1980).
Cultivar variety is one of the essential choices that the cultivator should be taken into account every period.

**MATERIALS & METHODS**

The experiment was conducted in the research farm in Malta station, Duhok / Iraq during 2019 growing season, which located at (latitude 36.51N, longitude 42.52 E and 473 m above sea level). The area of experience was 500 m². It was equipped with drip irrigation system.

Field research was arranged in experiments of factorial were carried with split – split plot design in (RCBD) with three replication. Hybrids as distributed in the main plot, sea weed treatment was arranged in the sub plots, and plastic mulch in sub – sub plot. The experience consisted of two Eggplants Hybrid (Anomoro and Vivo), three plastic mulch (Black, Clear and bare soil) and three level of sea weed (Maxi Grow) (0.0 ml⁻¹ 30 ml⁻¹ 60 ml⁻¹ (2x3x3 = 18). Over all, it was done before planting, sea weed spraying were applied three times within fifteen days intervals, starting after 4 true leaves stage. The results were analysed using the SAS, program. Means value were compared using Duncan’s multiple range test at 0.05 or 5% level (AL-Rawi and Khalaf Alah, 2000).

**RESULTS**

**Plant height (cm)**

Data present in table (1) showed no difference between hybrids in plant height. Concerning the effect of mulching on plant high observer significant difference the clear mulch had higher plant height, clear mulch 107.56 cm compared without mulch 100.94 cm. About the effect of seaweed on plant height no difference had been between all level of seaweed on plant height. Regarding the interaction between cultivars and mulching showed significant difference, Anomoro hybrid had higher value (110 cm) in clear mulching. The interaction between cultivars and seaweed no difference occurred between them. The interaction between mulching and seaweed it is significant difference at level of 60mL⁻¹. (115.83cm) in clear mulch compared by black mulch (98.33 cm), hybrid had higher value. The interaction among all factors showed the plant height was significant at Vivo hybrid (116. Anomoro 00 cm). 60mL⁻¹ in clear mulching and 115.67cm clear mulching at Anomoro hybrid (115.67 cm).

| Cultivars | Mulching | seaweed. | Cultivars*mulch | Cultivars |
|-----------|----------|----------|-----------------|-----------|
|           | 0 ml⁻¹   | 30 ml⁻¹  | 60 ml⁻¹         |           |
| Anomoro   | Without  | 90.67 d  | 101.33 a-d      | 94.33 cd  | 95.44 c  | 103.22 a |
|           | Clear    | 106.00 a-d | 109.00 a-c | 115.67 a  | 110.22 a |
|           | Black    | 103.00 a-d | 106.00 a-d | 103.00 a-d | 104.00 a-c |
| Vivo      | Without  | 112.00 ab | 101.67 a-d | 105.67 a-d | 106.44 ab | 103.37 a |
|           | clear    | 95.00 b-d | 103.67 a-d | 91.60 a    | 104.89 ab |
|           | Black    | 100.33 a-d | 102.33 a-d | 93.67 cd   | 98.78 bc |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

For data collection five plants were randomly selected from each experimental.

Table (1): Effect of seaweed and mulching by different plastic colour on plant height (cm) of two Eggplants hybrid.

| Cultivars* seaweed. | Anomoro | 99.89 a | 105.44 a | 104.33 a |
|---------------------|---------|---------|----------|----------|
| Vivo                | 102.44 a | 102.56 a | 105.11 a |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.
Number of branches:
The table (2) shows no variance between hybrids regarding the number of branches only hybrid vivo was superior 16.22 in comparison with Anomoro hybrid 15.59 branch. About the effect of mulching no significant difference among. Concerning the effect of seaweed was significant difference among level of seaweed sprayed at rate of 60 ml.l⁻¹ 16.67 branches compared with out spray 14.89 rise by 10.67%.

In case of interaction between cultivars and mulching, there was no significant variance between them the interaction between cultivars and seaweed remarked significant difference, hybrid Vivo 17 branches at level of 60 ml.l⁻¹.

Table (2): Effect of spray with seaweed and mulching by different plastic colour on number of branches of two Eggplants hybrid.

| Cultivars | Mulching   | Conc.     | Cultivars*mulch | Cultivars |
|-----------|------------|-----------|-----------------|-----------|
|           |            | 0 ml.l⁻¹  | 30 ml.l⁻¹       | 60 ml.l⁻¹ |
| Anomoro   | Without    | 14.00 bc  | 15.00 bc        | 15.00 ac  | 14.67 a  | 15.59 a |
|           | Clear      | 15.33 a-c | 17.67 a-c       | 16.33 a-c | 16.44 a  |
|           | Black      | 14.00 bc  | 15.33 a-c       | 17.67 a-c | 15.67 a  |
| Vivo      | Without    | 18.00 ab  | 17.33 a-c       | 15.33 a-c | 16.89 a  | 16.22 a |
|           | Clear      | 13.33 c   | 17.00 a-c       | 19.67 a   | 16.67 a  |
|           | Black      | 14.67 bc  | 14.67 bc        | 16.00 a-c | 15.11 a  |
| seaweed.  |            |           |                 |           |
|           | Anomoro    | 14.44 b   | 16.00 ab        | 16.33 ab  |
|           | Vivo       | 15.33 ab  | 16.33 ab        | 17.00 a   |
| Mulch* seaweed. | Without | 16.00 ab  | 16.17 ab        | 15.17 ab  | 15.78 a  |
|           | Clear      | 14.33 b   | 17.33 ab        | 18.00 a   | 16.56 a  |
|           | Black      | 14.33 b   | 15.00 ab        | 16.83 ab  | 15.39 a  |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

In a seam table the interaction between mulching and seaweed observer significant difference at level of 60 ml.l⁻¹ in clear mulching 18 branches comparative with control 14.33 branches. Regarding the triple interaction it was significant difference among three factors in concentrates 60 ml.l⁻¹ in clear mulch at vivo hybrid 19.67 comparative with control 13.33 in a seam hybrid.

Fruit weight (g)
Table number (3) demonstrated no significant difference in average fruit weight between both eggplant hybrids, the hybrid Vivo was superior with 185.52g/fruit compared by Anomoro 175.04g.

There was no significance between seaweed concentration a supra fruit weight. Regarding the influence of mulching there was significant changes among the plastic color on fruit weight, black mulching was superior 192.22g compared by without mulch 157.67g rising by 22.36%.

About the interaction between cultivars and mulching there were significant variances between cultivars and mulching the cultivar Vivo with clear mulch 203.88g compared with out mulch 157.00g at Anomoro hybrid.

Concerning the collaboration between cultivars and seaweed concentration no significant difference between cultivars and seaweed, Vivo hybrid was superior 188.00g in concentration 60 ml.l⁻¹ compared with 169.44g at level 30 ml.l⁻¹.

Regarding the interaction between mulching and seaweed level, there were significant change, at level of 60 ml.l⁻¹ was 211.52g in black mulch compared with a seam level 148.50g, with out mulch increasing by 29.78%.
Table (3): Effect of spray with seaweed and mulching by different plastic colour on fruit weight (g) of two Eggplants hybrid.

| Cultivars | Mulching    | Conc.  | Cultivars*mulch | Cultivars |
|-----------|-------------|-------|----------------|-----------|
|           | 0 ml.l⁻¹   | 30 ml.l⁻¹ | 60 ml.l⁻¹      |           |
| Anomoro   | Without     | 157.33 d-f | 164.67 c-f     | 149.00 f  | 157.00 c | 175.04 a |
|           | Clear       | 168.33 c-f | 171.67 b-f     | 194.00 a-d| 178.00 b |
|           | Black       | 184.00 a-f | 172.00 b-f     | 214.33 a  | 190.11 ab|
| Vivo      | Without     | 155.00 ef  | 172.00 b-f     | 148.00 f  | 158.33 c | 185.52 a |
|           | Clear       | 198.00 a-c | 206.33 ab      | 207.33 ab | 203.89 a |
|           | Black       | 191.33 a-e | 183.00 a-f     | 208.67 ab | 194.33 ab|
| Seaweed   |             | 175.67 a  | 178.28 a       | 186.89 a  |           |
| Cultivars*Conc. | Anomoro     | 169.89 a  | 169.44 a       | 185.78 a  |           |
|           | Vivo        | 181.44 a  | 187.11 a       | 188.00 a  |           |
| Mulch*Conc. | Without     | 156.17 de | 168.33 c-e     | 148.50 e  | 157.67 b |
|           | Clear       | 183.17 bc | 189.00 a-c     | 200.67 ab | 190.94 a |
|           | Black       | 187.67 a-c | 177.50 b-d     | 211.50 a  | 192.22 a |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

The interaction among three factors there were significant difference, best result obtained in Anomoro hybrid at level of 60 ml.l⁻¹ and black mulch 214.33g compared with 148g in a seam level with out mulch in Vivo hybrid rising by 30.9%.

**Number of fruit/plant**

Table (4) illustrated number of fruit/plant, no difference was found between hybrids regarding number off fruits/plant. The effect of seaweed on number of fruits, remarked a significant difference among level of seaweed on concentration of 30 ml.l⁻¹ 11.84 compared with out seaweed 11.27 fruits. Concerning the influence of mulching were significant difference among mulching, the best result obtained with clear mulch 12.07 fruits compared with out mulch 10.98 rise by 9.27%.

About the interaction between cultivars and mulching there were significant difference in number of fruit/plant, hybrid Anomoro were superior with clear mulch 12.14 fruits compared without mulch 11.17 in a seam hybrid increasing by 8.68%.

Concerning the interaction between cultivars and seaweed level, there were substantial difference between hybrid and amount of seaweed, hybrid Anomoro overcome 11.99 fruits at rate of 30 ml.l⁻¹ at the seam hybrids at level zero ml.l⁻¹ 11.16 fruits rising by 6.92%.

The collaboration between mulching and level of seaweed, there were significant variance, the clear mulch at rate of 30 ml.l⁻¹ 12.25fruits compared by control without mulch 10.42 fruits was raised by 14.93%.

Regarding the interaction among three factors observer significant difference hybrid Anomoro at level of 60 ml.l⁻¹ and clear mulch 12.40 fruits compared by a seam hybrid 10.13 with out mulch rise by 22.40%.
Table (4): Effect of spray with seaweed and mulching by different plastic colour on number of fruit/ plant.

| Cultivars | Mulching | seaweed | Cultivars*mulch | Cultivars |
|-----------|----------|---------|-----------------|-----------|
|           | 0 ml.l⁻¹ | 30 ml.l⁻¹ | 60 ml.l⁻¹      |           |
| Anomoro   |          |         |                 |           |
| Without   | 10.13 g  | 12.37 a | 11.00 d-f       | 11.17 b   |
| Clear     | 11.83 a-d| 12.20 a-c| 12.40 a         | 12.14 a   |
| Black     | 11.50 b-d| 11.40 c-f| 10.77 e-g       | 11.22 b   |
| Vivo      |          |         |                 |           |
| Without   | 10.70 e-g| 11.07 d-f| 10.63 f         | 10.80 b   |
| Clear     | 12.23 a-c| 12.30 ab | 11.47 b-f       | 12.00 a   |
| Black     | 11.23 d-f| 11.73 a-d| 12.27 ab        | 11.74 a   |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

**Fruit diameter (cm)**

Table (5) shown the effect of mulching and spray with seaweed on fruit diameter. The hybrid vivo (3.83 cm) was significant variation compared with anomoro hybrid (3.72 cm) raised by 2.95%.

The effect of mulching on fruit diameter no significant affect. About the effect of seaweed on fruit diameter were significant difference at level 60 ml.l⁻¹ 3.82cm compared by 3.72 cm at rate of 30 ml.l⁻¹ rises with 2.61%. The interaction between cultivars and mulching on fruit diameter which caused significant effected hybrid Vivo (3.87 cm) a supra control (3.60 cm). About the interaction between cultivars and seaweed spraying was significant difference, best result obtained in hybrid Vivo (3.89 cm) at level 60 ml.l⁻¹ compared by 3.69 cm in concentrate 30 ml.l⁻¹. Concerning the binary interaction between mulching and seaweed concentration on fruit diameter, its caused significant the high value obtained 3.89 cm at level of 60 ml.l⁻¹ in clear mulch compared with control 3.66 cm in black mulch.

Table (5): Effect of spray with seaweed and mulching by different plastic colour on fruit diameter (cm) of two Eggplants hybrid

| Cultivars | Mulching | seaweed | Cultivars*mulch | Cultivars |
|-----------|----------|---------|-----------------|-----------|
|           | 0 ml.l⁻¹ | 30 ml.l⁻¹ | 60 ml.l⁻¹      |           |
| Anomoro   |          |         |                 |           |
| Without   | 3.71 bc  | 3.74 bc | 3.63 c          | 3.69 c    |
| Clear     | 3.75 bc  | 3.70 bc | 3.86 a-c        | 3.77 a-c  |
| Black     | 3.75 bc  | 3.63 c  | 3.75 bc         | 3.71 bc   |
| Vivo      |          |         |                 |           |
| Without   | 3.77 a-c | 3.84 a-c| 3.87 ab         | 3.83 ab   |
| Clear     | 3.88 ab  | 3.73 bc | 3.99 a          | 3.87 a    |
| Black     | 3.88 ab  | 3.69 bc | 3.81 a-c        | 3.79 a-c  |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.
Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

About the triple interaction among three factors observer significant difference

Between factors the best result obtained in hybrid Vivo (3.99 cm) at level of 60 mL.1\(^{-1}\) in clear mulch compared with 3.66 cm rising by 8.27%.

**Fruit length (cm)**

Table (6) Demonstrated the effect of seaweed sparing and mulching of two eggplants hybrid on fruit length (cm), which affected significantly difference between hybrids. Hybrid Anomoro overcome on hybrid Vivo 14.37 cm respective 13.86 cm increasing by 3.54%.

About the effect of mulching on fruit length remarked significant affect on the clear mulch 14.37cm compared without mulch 13.83 cm. Regarding the effect of seaweed on eggplant fruits length, observer no significant difference among seaweed rate application.

Regarding the interaction between cultivars and mulching on fruit length which initiated significant difference hybrid Anomoro with clear mulch 1 4.82 cm compared with Vivo hybrid 13.72 cm rise by 7.42%. About interaction between cultivars and seaweed remarked significant difference between hybrids and seaweed sparing hybrid Anomoro 14.55 cm at level 60 mL.1\(^{-1}\) increased by 5.5% a supra Vivo at level zero seaweed.

**Table (6): Effect of spray with seaweed and mulching by different plastic colour on fruit length (cm) of two Eggplants hybrid.**

| Cultivars | Mulching | 0 mL.1\(^{-1}\) | 30 mL.1\(^{-1}\) | 60 mL.1\(^{-1}\) | Cultivars*mulch | Cultivars |
|-----------|----------|----------------|----------------|----------------|----------------|------------|
| Anomoro   | Without  | 14.08 bc       | 13.80 bc       | 13.94 bc       | 13.94 b        | 14.37 a    |
|           | clear    | 14.20 bc       | 14.85 ab       | 15.42 a        | 14.82 a        |            |
|           | black    | 14.63 ab       | 14.13 bc       | 14.29 bc       | 14.35 ab       |            |
| Vivo      | Without  | 13.42 c        | 13.71 bc       | 14.02 bc       | 13.72 b        | 13.86 b    |
|           | clear    | 13.77 bc       | 14.08 bc       | 13.90 bc       | 13.92 b        |            |
|           | Black    | 14.07 bc       | 13.84 bc       | 13.94 bc       | 13.95 b        |            |
| seaweed.  |          | 14.03 a        | 14.07 a        | 14.25 a        |                |            |
| Cultivars*seaweed. | Anomoro | 14.30 ab | 14.26 ab | 14.55 a |            |            |
|           | Vivo     | 13.76 b        | 13.88 b        | 13.95 ab       |                |            |
| Mulch* seaweed. | Without | 13.75 b       | 13.76 b        | 13.98 ab       | 13.83 b        |            |
|           | Clear    | 13.98 ab       | 14.47 ab       | 14.66 a        | 14.37 a        |            |
|           | Black    | 14.35 ab       | 13.98 ab       | 14.11 ab       | 14.15 ab       |            |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

Apropos the interaction between mulching and seaweed caused significant difference at level of 60 mL.

1\(^{-1}\) with clear mulch 14.66 cm compared without mulch and zero seaweed 13.75 cm.

About the triple interaction among three factors the results was a significant difference the high value in Anomoro hybrid 15.42 cm at level 60 mL.1\(^{-1}\) with clear mulch comparative with Vivo hybrid 13.42 cm without mulching increasing by 12.97%.

**Total chlorophyll content (SPAD)**

a.jabbar55@yahoo.com
Regarding data in the table (7) Demonstrated no significant variance between hybrids on chlorophyll content in eggplant leaves Hybrid Vivo was better than Anomoro 63.68 respective 62.21.

The effect of mulching a supra chlorophyll content in eggplant leaves was significant difference the clear mulch with 64.52 was superior compared without mulch 60.57. Concerning the effect of seaweed on chlorophyll content no significant difference between all level of seaweed application.

**Table (7):** Effect of sparing with seaweed and mulching by differed plastic color on vegetative and yield of two Hybrids of Eggplant on leaf chlorophyll percentage (SPAD)

| Cultivars | Mulching | Mulching* seaweed. | Cultivars+mulch |
|-----------|----------|-------------------|-----------------|
|           | 0 ml.l⁻¹| 30 ml.l⁻¹         | 60 ml.l⁻¹       |
| **Anomoro** |        |                   |                 |
| Without   | 61.77 ab| 59.23 b           | 61.17 ab        | 60.72 b        | 62.21 a |
| Clear     | 64.83 ab| 63.70 ab          | 61.13 ab        | 63.22 ab       |
| Black     | 63.40 ab| 61.57 ab          | 63.07 ab        | 62.68 ab       |
| **Vivo**  |        |                   |                 |
| Without   | 59.17 b | 59.83 b           | 62.23 ab        | 60.41 b        | 63.68 a |
| Clear     | 69.00 a | 64.13 ab          | 64.30 ab        | 65.81 a        |
| Black     | 63.03 ab| 64.73 ab          | 66.67 ab        | 64.81 ab       |
| sewage.   | 63.53 a | 62.20 a           | 63.09 a         | 62.22 b        | 63.74 a |
| **Cultivars** sewage. | |                   |                 |
| Anomoro   | 63.33 a | 61.50 a           | 61.79 a         | 60.47 b        | 63.68 a |
| Vivo      | 63.73 a | 62.90 a           | 64.40 a         | 66.92 a        | 64.52 a |
| **Mulch** sewage. | |                   |                 |
| Without   | 60.47 b | 59.53 b           | 61.70 ab        | 60.57 b        |
| Clear     | 66.92 a | 63.92 ab          | 62.72 ab        | 64.52 a        |
| Black     | 63.22 ab| 63.15 ab          | 64.87 ab        | 63.74 a        |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

In interaction between cultivars and mulching observer significant difference between cultivars and mulching, the best result obtained in hybrid Vivo 65.81 at clear mulching compared with hybrid Anomoro 60.72 without mulch, with increasing by 7.73%.

Also the interaction between cultivars and seaweed on chlorophyll content in eggplant leaves was no significant in chlorophyll in both hybrids, the best result were obtained in Vivo hybrid at rate of 60 ml.l⁻¹ 64.40 compared with hybrid Anomoro at rate of zero seaweed in clear 63.33.

About the interaction between mulching and seaweed on chlorophyll content in the eggplant leaves, showed significant difference between mulching and seaweed observer in the clear mulch 66.92 without seaweed ,compared without mulch at level of 30 ml.l⁻¹ 59.53 rise by 11.04%.

The interaction among three factors remarked significant difference on chlorophyll content in the leaves. The highest value obtained in Vivo hybrid with clear mulching without seaweed 69.00 comparative with control 59.17 at level 30 ml.l⁻¹ increasing by 14.24%.

**Fresh weight (kg)**

Data from table (8 ) show no significant difference between both hybrids regarding the fresh weight in vegetative growing. Hybrid Vivo gave higher result 0.615 kg compared to Anomoro hybrid 0.564 kg increased by 829%.

About the effect of mulching on vegetative fresh weight at eggplant hybrids, no significant difference between mulching, clear mulch 0.631kg compared without mulch 0.566kg. Regarding the effect of seaweed no significant chinch between all level a supra fresh weight in vegetative growth of eggplant.

About the interaction between cultivars and mulching in fresh weight remarked no significant difference between hybrids. In the level of 60 ml.l⁻¹ and clear mulching gave 0.681 kg.
increasing by 8.95% a supra hybrid Anomoro without mulching 0.529 kg.

Concerning the interaction between cultivars and spraying with seaweed on fresh weight in eggplant showed no significant modification between hybrids and rate of seaweed application, in the rate of 60 ml. l⁻¹ and clear much, Vivo hybrid gave 0.687 kg raised by 5.12% a supra hybrid Anomoro at level of 30 ml. l⁻¹.

Apropos the collaboration between mulching and seaweed application on fresh weight observer no significant difference in all level of seaweed and mulching best result obtained at rate of 60 ml. l⁻¹ in clear mulch 0.657 and without seaweed rate of zero ml. l⁻¹ seaweed gave 0.524 kg.

Referring the interaction among all factor it was no significant difference among three factor bout hybrid Vivo gave maximum result 0.723 kg fresh weight at level of 30 ml. l⁻¹ without mulching compared with control 0.479 kg at level of zero ml. l⁻¹

**Table (8):** Effect of spray with seaweed and mulching by different plastic colour on fresh weight (kg) of two Eggplants hybrid.

| Cultivars | Mulching | seaweed. | Cultivars*mulch | Cultivars |
|-----------|----------|----------|----------------|-----------|
|           | 0 ml. l⁻¹ | 30 ml. l⁻¹ | 60 ml. l⁻¹ |           |
| Anomoro   | Without  | 0.569 a  | 0.528 a  | 0.489 a  | 0.529 a  | 0.564 a |
|           | Clear    | 0.533 a  | 0.570 a  | 0.636 a  | 0.580 a  |
|           | Black    | 0.642 a  | 0.566 a  | 0.546 a  | 0.584 a  |
| Vivo      | Without  | 0.479 a  | 0.723 a  | 0.607 a  | 0.603 a  | 0.615 a |
|           | Clear    | 0.702 a  | 0.665 a  | 0.677 a  | 0.681 a  |
|           | Black    | 0.536 a  | 0.674 a  | 0.471 a  | 0.561 a  |
|           | seaweed. | 0.577 a  | 0.621 a  | 0.571 a  |           |
|           | Cultivars* seaweed. | Anomoro | 0.581 a  | 0.555 a  | 0.557 a  |
|           |           | Vivo     | 0.572 a  | 0.687 a  | 0.585 a  |
|           | Mulch* seaweed. | Without | 0.524 a  | 0.626 a  | 0.548 a  | 0.566 a |
|           |           | Clear    | 0.617 a  | 0.617 a  | 0.657 a  | 0.631 a  |
|           |           | Black    | 0.589 a  | 0.620 a  | 0.509 a  | 0.573 a  |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

**Dry weight (g)**

Table (9) show effect of mulching, seaweed on leaf dry matter of two eggplant hybrids. Data in table (9) demonstrated no significant change between hybrids in dry matter Vivo hybrid gave 149.63 g compared with Anomoro 145.20 g. Plant mulching was not affected significant 157.50g compared with black mulch 139.64g. The effect of seaweed on dry matter no significant difference among all level of seaweed.

Apropos the interaction between cultivars and mulching on dry matter no significant difference between hybrids, Vivo hybrid with clear mulch 168.72 g was higher than Anomoro without mulch was raised by 17.28% .

Concerning the interaction between cultivars and seaweed spraying there was no significant difference between them, highest value obtained in Vivo hybrid at level of 30 ml. l⁻¹ 168.06 g, compared with a seam hybrid in zero ml. l⁻¹ 134.33 g increasing by 20.07%.
Table (9): Effect of spray with seaweed and mulching by different plastic colour on dry weight (g) of two Eggplants hybrid.

| Cultivars | Mulching | seaweed. | Cultivars*mulch | Cultivars |
|-----------|----------|----------|-----------------|-----------|
|           | 0 ml.l\(^1\) | 30 ml.l\(^1\) | 60 ml.l\(^1\) |           |
| Anomoro   |          |          |                  |           |
| Without   | 143.00 a | 145.83 a | 129.83 a         | 139.56 a |
| Clear     | 141.83 a | 144.50 a | 152.50 a         | 146.28 a |
| Black     | 175.67 a | 138.33 a | 135.33 a         | 149.78 a |
| Vivo      |          |          |                  |           |
| Without   | 122.17 a | 180.50 a | 149.33 a         | 150.67 a |
| Clear     | 172.83 a | 159.00 a | 174.33 a         | 168.72 a |
| Black     | 108.00 a | 164.67 a | 115.83 a         | 129.50 a |
| seaweed.  |          |          |                  |           |
| Anomoro   | 143.92 a | 155.47 a | 142.86 a         |           |
| Vivo      | 153.50 a | 142.89 a | 139.22 a         |           |
| Mulch* seaweed. | | | | |
| Anomoro   | 153.50 a | 142.89 a | 139.22 a         |           |
| Vivo      | 157.33 a | 151.75 a | 163.42 a         |           |
| Mulch* seaweed. | | | | |
| Anomoro   | 132.58 a | 163.17 a | 139.58 a         |           |
| Vivo      | 157.33 a | 151.75 a | 163.42 a         |           |
| Black     | 147.83 a | 151.50 a | 125.58 a         |           |
| Cultivars* seaweed. | | | | |
| Anomoro   | 153.50 a | 142.89 a | 139.22 a         |           |
| Vivo      | 134.33 a | 168.06 a | 146.50 a         |           |
| Black     | 211.83 a | 164.67 a | 115.83 a         |           |
| Seam      | 143.92 a | 155.47 a | 142.86 a         |           |
| Cultivars* mulch | | | | |
| Anomoro   | 153.50 a | 142.89 a | 139.22 a         |           |
| Vivo      | 157.33 a | 151.75 a | 163.42 a         |           |
| Black     | 147.83 a | 151.50 a | 125.58 a         |           |
| Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

Yield/plant (kg)

Table (10) show the effect of spray by seaweed and differed mulching color on yield/plant in kg of two hybrids of eggplant, there were no significant difference between hybrids, hybrid Vivo was higher than Anomoro by 5.97%.

The effect of seaweed on yield/plant no significant difference in all rate of seaweed a supra yield/plant kg. Concerning the effect of mulching, there were significant difference among mulching clear mulch 2.30 compared without mulch 1.73 kg rise by 32.94%.

Concerning the interaction between cultivars and mulching, observed significant difference, hybrid Vivo 2.44g with clear mulch over come with a seam hybrid without mulch 1.70 kg increasing by 30.32%.

Table (10): Effect of spray with seaweed and mulching by different plastic colour on yield/ plant (kg) of two Eggplants hybrid.

| Cultivars | Mulching | seaweed. | Cultivars*mulch | Cultivars |
|-----------|----------|----------|-----------------|-----------|
|           | 0 ml.l\(^1\) | 30 ml.l\(^1\) | 60 ml.l\(^1\) |           |
| Anomoro   |          |          |                  |           |
| Without   | 1.59 e   | 2.04 b-e | 1.64 de          | 1.75 c    | 2.01 a |
| Clear     | 1.99 b-e | 2.09 a-d | 2.41 ab          | 2.16 b    |       |
| Black     | 2.11 a-d | 1.95 b-e | 2.30 a-c         | 2.12 b    |       |
| Vivo      |          |          |                  |           |
| Without   | 1.65 de  | 1.90 c-e | 1.56 e           | 1.70 c    | 2.13 a |
| Clear     | 2.42 ab  | 2.54 a   | 2.37 a-c         | 2.44 a    |       |
| Black     | 2.15 a-c | 1.99 b-e | 2.57 a           | 2.24 ab   |       |
| Seaweed   | 1.99 a   | 2.08 a   | 2.14 a           |           |
| Cultivars*Conc. | | | | |
| Anomoro   | 1.90 a   | 2.03 a   | 2.11 a           |           |
| Vivo      | 2.07 a   | 2.14 a   | 2.17 a           |           |
| Mulch*Conc. | | | | |
| Anomoro   | 1.62 c   | 1.97 b   | 1.60 c           | 1.73 b    |       |
| Vivo      | 2.20 ab  | 2.31 a   | 2.39 a           | 2.30 a    |       |
| Black     | 2.13 ab  | 1.97 b   | 2.43 a           | 2.18 a    |       |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.

a.jabbar55@yahoo.com
About the interaction between cultivars and seaweed level no significant difference between hybrids and rate of seaweed, higher result obtained in hybrid Vivo 217kg at rate of 60 ml.\(^1\) compared by Anomoro hybrid 1.90 kg without seaweed. The interaction between mulching and seaweed level

There were significant difference black mulch with rate of 60 ml.\(^1\) 2.43 kg compared by without mulch at rate of 60 ml.\(^1\) 1.60 kg rise by 34.15%.

Regarding the interaction among three actors, there were significant variance in Vivo hybrid at black mulching and rate of 60 ml.\(^1\) 2.43 kg compared by without mulch at rate of 60 ml.\(^1\) 1.60 kg rise by 34.15%.

The effect of seaweed on yield ton/ha There were no significant modification regarding the rate of seaweed application. About the influence of mulching on yield, there were significant differences among plastic mulch, clear mulch with 86.33 ton/hectare compared without mulch 65.34 ton rise by 32.21 %.

The interaction between cultivars and mulching, it is significant difference between cultivars and plastic mulch color, hybrid Vivo with clear mulch were significant 91.54 ton compared by a seam hybrid without mulch 64.92 ton increasing by 29.01%

Referring the interaction between cultivars and level of seaweed sprayed where were significant change, hybrid Vivo at rate of 60 ml.\(^1\) with 82.24 t/h compared by hybrid Anomoro at zero ml.\(^1\) 71.11 t/h rise by 15.65 %.

Concerning the collaboration between mulching and seaweed concentration, there were significant influence a supra yield t/h, best result obtained at level of 60 ml.\(^1\) in black mulch related without mulch without seaweed 91.12 t/h respective 60.75 t/h increasing by 33.32%

Table (11) illustrated effect of seaweed, plastic mulch on yield ton/ha of two eggplant hybrids, there are no significant differences between hybrids, only hybrid Vivo 80.09 ton/hectare overcome to Anomoro hybrid 74.91ton/hectare by 6.46%.

The effect of seaweed on yield ton/ha there were no significant modification regarding the rate of seaweed application. About the

| Cultivars | Mulching | seaweed | Cultivars*mulch | Cultivars |
|----------|----------|---------|----------------|-----------|
|          | 0 ml.\(^1\) | 30 ml.\(^1\) | 60 ml.\(^1\) |           |
| Anomoro  | Without  | 59.53 f | 76.37 b-f | 61.37 ef | 65.76 c | 74.91 a |
|          | Clear    | 74.60 b-f | 78.60 a-e | 90.17 ab | 81.12 b |
|          | Black    | 79.21 a-e | 68.20 d-f | 86.17 a-d | 77.86 b |
| Vivo     | Without  | 61.97 ef | 71.10 c-f | 61.70 ef | 64.92 c | 80.09 a |
|          | Clear    | 90.57 ab | 95.10 a | 88.97 a-c | 91.54 a |
|          | Black    | 80.70 a-d | 74.60 b-f | 96.07 a | 83.79 a |
| Seaweed  |          | 74.43 a | 77.33 a | 80.74 a | Mulching |
| Cultivars*seaweed | Anomoro  | 71.11 b | 74.39 ab | 79.23 ab |
|          | Vivo     | 77.74 ab | 80.27 ab | 82.24 a |
| Mulch*seaweed. | Without  | 60.75 c | 73.73 b | 61.53 c | 65.34 b |
|          | Clear    | 82.58 ab | 86.85 a | 89.57 a | 86.33 a |
|          | Black    | 79.95 ab | 71.40 bc | 91.12 a | 80.82 a |

Means within a column, row and their interactions followed with the same letters are not significantly different from each other according to Duncan’s multiple range test at 5% level.
DISCUSSION

It clear from tables (1-9) effect of factors studied (Hybrids, Seaweed, mulching) and their interaction have a significant effect on vegetative growth. The result showed that the Hybrid Vivo overcome Hybrid Anomoro on all most vegetative characters (plant height, Number of branches, chlorophyll, fresh and dry matter) and fruits characters (fruits weight, number of fruit/plant, fruit diameter, and yield). This effect my be due to differences in genotype between Hybrids, and different in root system to absorbs more nutrition (Rasheed, S.M, S 2013) or better environmental condition reported by (Mohammed, 2015. Passam and khah 1992).

Seaweed extract has a better role in development of fruit and yield in eggplant and vegetative character the confident effect of seaweed extract may be due to the role in improving vegetative growth such as number of branches and leaves area which leads more absorption of nutrient element the effect are in agreement with (Mohammed, 2013 and Abd El-Gawad and Osman 2014).

Regarding the effect of plastic mulch, its clear in table (1–9) mulching had increased almost all vegetative characters. Clear plastic mulch had better result compared with bare soil. This will be clarified in opinion in soil temperature and moisture (Abu-Goukh and El-Balla, 2003 and Mamkagh, 2009).

The develop fruit yield under plastic mulch can by also be attributed to reduced nutrient, weed control (Singh, 2005). Mulches promote crop development, early yield as found by (Adekalu et al., 2008).

Frank and Heineman, (1987) displayed that the warmest temperatures were observed under clear plastic mulch and the coolest under the black plastic mulch.

CONCLUSION

Established on the investigation results, it could be fixed that plastic mulches and seaweed (Maxi Grow) effects on the growth, and yield of Eggplant, and clear plastic showed higher performance between the plastic mulches. Clear plastic mulch was increased the fruits yield/plant, fruit number, plant high, and dry weight. Black mulch gave high fruit weight. Regarding the effect of seaweed, the level of 60 ml 1 provided high yield/plant, fruit diameter, fruit weight, number of branches, yield kg/m². Therefore, the farming of Eggplant using clear plastic mulch and black. The hybrid Vivo was better then Anomoro in maximum characteristics.

REFERENCE

Abd El-Gawad, H.G. and Osman, H.S. (2014). Effect of Exogenous Application of Boric Acid and Seaweed Extract on Growth, Biochemical Content and Yield of Eggplant. Journal of Horticultural Science and Ornamental Plants. 6(3): 133-143.

Abu-Goukh, A.B.A. and El-Balla (2003). Use of plastic mulch and better performance and yield of okra during winter in Sudan. K. J. Agric. Sci., 11: 165-178.

Adekalu K. O.; L.A. O. Ogunjimi; F. O. Olaosebikan and S. O. Afolayan(2008). Response of okra to irrigation and mulching. Inter. J. of Vege. Sci. 14: 339-350

Agoreyo. B.O., Obansa, E.S. and Obanor, E.O. (2012). Comparative nutritional and phytochemical analyses of two varieties of Solanum melongena. Science World Journal. 7(1): 16-17.)

Aitken, J. B. and T. L. Senn (1965). Seaweeds products as a fertilizer and soil conditioner for horticultural crops. Botanica Marina. Volume 8, Issue 1, Pages 144–147.

Al-Rawi, Kh. M. and Khalaf Allah, A. A. M. 2000. Designation and analysis of agricultural experiments. Directorate of Book HouseFor Publishing and pressing. Mosul University, Iraq. (in Arabic).

Brown J. E and C. Bucher 1999. Effect of three row cover and plastic mulch on growth and yield of Clemson spineless, okra. J,of vege. Crop production 5(2):67-71.

Chapman, V.J and D.J. Chapman (1980). Seaweeds and their uses. Third Editions. Chapman and Hall, USA, p. 334

Chen N C and Li. H. M.(2000). Cultivation and phytochemical analyses of two var of Solanum spineless, okra. J,of vege. Crop production 5(2):67-71.

Das.s., Mandal, A. And Hazra, p.(2010) Genetic diversity in brinjal genotypes under eastern Indian condition. Indian journal of Horticulture 67 ( 4 ): 164-169.

Durand,N., Brian.X., and Meyer.C (2003): The effect of marine bioactive substances (N PRO) and edogenouscytokinins on nitratedeductasa activity in Arabidopsis thaliana. Physiol. Plant. 119:489-493.

Frank J. D. and R.R. Heineman (1987). Influence of polyethylene covered trenches on yield of Bell papper. Hort. Sci. 22(2): 225-227

a.jabbar55@yahoo.com
Hatimi, S.; A. Nourjou; M. Henareh and L. Pourakbar (2012). Comparison effects of different methods of black plastic mulching and planting patterns on weed control, water-use efficiently and yield in tomato crops. Int. J. Agric. Sci. 2:928-934.

Kantharajah A. and Golegaonkar, P. (2004) Somatic embryogenesis in eggplant. Scientia Horticulturae 99(2):107-1117.

Mamkagh, A. M. A (2009). Effect of Tillage Time and plastic mulch on growth and yield of okra; (Abelmoschus esculentus) Grown under rain fed conditions. Int. J. Agric. Biol. 11(4):453-457.

Miyasaka, S.C., J.R. Hollyer and L.S. Kodani, 2001. Mulch and compost effects on yield and corn roots of alfalfa. Field Crops Res., 71(2): 101-112.

Mohammed, M.O. (2015). Effect of Planting Dates and Biofertilization on Growth Yield, and Yield Quantity of Three Okra Cultivars (Abelmoschus esculentus L.) Under Protective Conditions. MSc. Thesis, Collage of Agriculture, University of Duhok, Duhok, Iraq.

Summers C.G. and Stapleton J.J. 2002.Use of UV reflective mulch to delay the colonization and reduce severity of Bemesia argentifolii (Homoptera: Aleyrodidae) infestations in cucurbits Crop Prot. 219:21928.

Zenia M. Halina B (2008). Content of microelements in eggplant fruits depending on nitrogen fertilization and plant training method. J. Elementol., 13(2):269-274.

Oñate, J.J. and B. Peco, 2005. Policy impact on desertification: stakeholders’ perceptions in southeast Spain.

Passam H.C. and Khah, E.M., (1992) Flowering, Fruit set and seed development in two cultivars of aubergine (Solanum melongena L.) grown under plastic cover. Scientia Horticult., 51:179-185

Rasheed, S.M, S 2013. Effect of planting density and nutrient foliar spray on growth, yield and yield quality of Two Tomato cultivars (Lycopersicon esculentum Mill.) Growth under plastic House Condition. Ph.D dissertation. College of agriculture, University of Duhok. Duhok, Iraq.

Singh, R. (2005). Influence of mulching on growth and yield of tomato (Lycopersicon esculentum) in north India plains. Vegetable Sci. 32(1): 55-58

Zhang, X.; E. H. Ervin and R. E. Schmidt (2003). Physiological effect of liquid applications of a seaweed extracts and humic acid on creeping. J. Amer. Soc. Hort. Sci. 128(4):492-49