

<b>CONTENTS</b>	<b>Pages</b>
<b>ACKNOWLEDGMENT</b> .....	
<b>ABSTRACT</b> .....	
<b>INTRODUCTION</b> .....	<b>1</b>
<b>REVIEW OF LITERATURE</b> .....	<b>5</b>
<b>1- Effect of organic fertilization :</b> .....	<b>5</b>
1-A- Vegetative growth parameters :.....	<b>5</b>
1-B- Yield and yield components parameters : .....	<b>12</b>
1-C- Chemical constituents parameters : .....	<b>17</b>
<b>2- Effect of vitamin E (<math>\alpha</math>-tocopherol) :</b> .....	<b>20</b>
2-A- Vegetative growth parameters : .....	<b>20</b>
2-B- Yield and yield components parameters : .....	<b>23</b>
2-C- Chemical constituents parameters : .....	<b>25</b>
<b>3- Effect of plant extracts :</b> .....	<b>27</b>
<b>3-1- Effect of garlic extract :</b> .....	<b>27</b>
3-1-A- Vegetative growth parameters : .....	<b>27</b>
3-1-B- Yield and yield components parameters : .....	<b>28</b>
3-1-C- Chemical constituents parameters : .....	<b>29</b>
<b>3-2- Moringa leaf extract :</b> .....	<b>30</b>
3-2-A- Vegetative growth parameters : .....	<b>30</b>
3-2-B- Yield and yield components parameters : .....	<b>33</b>
3-2-C- Chemical constituents parameters : .....	<b>35</b>
<b>3-3- Effect of aloe plant extract :</b> .....	<b>36</b>
3-3-A- Vegetative growth parameters : .....	<b>36</b>
3-3-B- Yield and yield components parameters : .....	<b>37</b>

3-3-C- Chemical constituents parameters : .....	37
<b>3-4- Effect of green tea extract : .....</b>	<b>38</b>
3-4-A- Vegetative growth parameters : .....	38
3-4-B- Yield and yield components parameters : .....	38
3-4-C- Chemical constituents parameters : .....	39
<b>MATERIALS AND METHODS .....</b>	<b>41</b>
<b>RESULTS .....</b>	<b>49</b>
<b>1- Effect of compost, vitamin E and some plant extracts, as well as, their interaction : .....</b>	<b>49</b>
<b>A- Vegetative growth parameters : .....</b>	<b>49</b>
A-1- Plant height (cm) : .....	49
A-2- Stem diameter (cm) : .....	52
A-3- Number of branches/plant : .....	56
A-4- Leaf area (cm <sup>2</sup> ) : .....	60
A-5- Shoot fresh weight/plant : .....	63
A-6- Shoot dry weight/plant : .....	67
A-7- Shoot fresh and dry weights/fed. : .....	70
<b>B- Root system traits : .....</b>	<b>75</b>
B-1- Number of nodules/root : .....	75
B-2- Fresh weight of nodules/root : .....	78
B-3- Roots fresh weight/plant : .....	81
B-4- Roots dry weight/plant : .....	84
<b>C- Yield and yield components parameters : .....</b>	<b>87</b>
C-1- Pod number/plant : .....	87
C-2- Seed number/ 5 pods : .....	90
C-3- Seed number/plant : .....	94
C-4- Weight of 100 seeds : .....	97

C-5- Seed yield /plant and /fed. : .....	<b>100</b>
<b>D- Chemical composition : .....</b>	<b>105</b>
D-1- Guaran percentage in the dry seeds : .....	105
D-2- Guaran yield /plant and /fed. : .....	<b>109</b>
D-3- Photosynthetic pigments : .....	<b>114</b>
D-4- Nitrogen, phosphorus and potassium % : .....	<b>121</b>
D-5- Total carbohydrates % : .....	<b>129</b>
D-6- Total protein % : .....	<b>132</b>
<b>DISCUSSION .....</b>	<b>136</b>
<b>SUMMARY AND CONCLUSION .....</b>	<b>141</b>
<b>REFERENCES .....</b>	<b>147</b>
<b>ARABIC SUMMARY .....</b>	

<b>LIST OF TABLES</b>	<b>Pages</b>
<b>Table (a) : Soil analysis :</b>	<b>41</b>
<b>Table (b) :Physical and chemical properties of the used compost :</b>	<b>43</b>
<b>Table (c) : Some chemical constituents of garlic cloves according to Arid Land Agricultural Research Unit :</b>	<b>44</b>
<b>Table (d) : Nutrient information and amino acids of moringa leaves :</b>	<b>44</b>
<b>Table (e) : Determination of phytohormones (GA<sub>3</sub>, IAA and ABA) in <i>Aloe vera</i> plant :</b>	<b>45</b>
<b>Table (1) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on plant height (cm) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>50</b>
<b>Table (2) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on stem diameter (cm) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>53</b>
<b>Table (3) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of branches/plant of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>57</b>
<b>Table (4) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on leaf area (cm<sup>2</sup>) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>61</b>
<b>Table (5) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on shoot fresh weight (g/plant) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>64</b>
<b>Table (6) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on shoot dry weight (g/plant) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>68</b>
<b>Table (7) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on shoot fresh weight/fed. (ton/fed.) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>71</b>
<b>Table (8) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on shoot dry weight/fed. (ton/fed.) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>73</b>

Table (9) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of nodules/root of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	76
Table (10) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on fresh weight of nodules/root (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	79
Table (11) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on roots fresh weight/plant (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	82
Table (12) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on roots dry weight/plant (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	85
Table (13) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of pods/plant of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	88
Table (14) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of seeds/ 5 pods of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	91
Table (15) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of seeds/plant of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	95
Table (16) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on dry weight of 100 seeds (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	98
Table (17) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on seed yield/plant (g/plant) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	101
Table (18) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on seed yield/fed. (kg/fed.) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	103
Table (19) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on guaran percentage in dry seeds of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	106
Table (20) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on guaran yield/plant (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	110

<b>Table (21) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on guaran yield/fed. (kg/fed.) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>112</b>
<b>Table (22) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on chlorophyll a content (mg/g f.wt.) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>115</b>
<b>Table (23) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on chlorophyll b content (mg/g f.wt.) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>117</b>
<b>Table (24) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on carotenoids content (mg/g f.wt.) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>119</b>
<b>Table (25) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on nitrogen percentage of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>122</b>
<b>Table (26) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on phosphorus percentage of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>124</b>
<b>Table (27) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on potassium percentage of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>126</b>
<b>Table (28) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on total carbohydrates percentage in the herb of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>130</b>
<b>Table (29) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on total protein percentage in the herb of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b>	<b>133</b>

<b>LIST OF FIGURES</b>	<b>Pages</b>
<p><b>Figure (1) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on plant height (cm) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<b>51</b>
<p><b>Figure (2) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on stem diameter (cm) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<b>54</b>
<p><b>Figure (3) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of branches/plant of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<b>58</b>
<p><b>Figure (4) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on leaf area (cm<sup>2</sup>) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<b>62</b>
<p><b>Figure (5) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on shoot fresh weight (g/plant) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<b>65</b>
<p><b>Figure (6) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on shoot dry weight (g/plant) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<b>69</b>
<p><b>Figure (7) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on shoot fresh weight/fed. (ton/fed.) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<b>72</b>
<p><b>Figure (8) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on shoot dry weight/fed. (ton/fed.) of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<b>74</b>
<p><b>Figure (9) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of nodules/root of guar</b></p>	<b>77</b>

( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	
Figure (10) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on fresh weight of nodules/root (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	80
Figure (11) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on roots fresh weight/plant (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	83
Figure (12) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on roots dry weight/plant (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	86
Figure (13) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of pods/plant of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	89
Figure (14) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of seeds/ 5 pods of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	92
Figure (15) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on number of seeds/plant of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	96
Figure (16) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on dry weight of 100 seeds (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	99
Figure (17) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on seed yield/plant (g/plant) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	102
Figure (18) : Effect of compost, vitamin E and some plant extracts (garlic, moringa,	104



aloe and green tea) treatments on seed yield/fed. (kg/fed.) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	
Figure (19) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on guaran percentage in dry seeds of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	107
Figure (20) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on guaran yield/plant (g) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	111
Figure (21) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on guaran yield/fed. (kg/fed.) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	113
Figure (22) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on chlorophyll a content (mg/g f.wt.) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	116
Figure (23) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on chlorophyll b content (mg/g f.wt.) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	118
Figure (24) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on carotenoids content (mg/g f.wt.) of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	120
Figure (25) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on nitrogen percentage of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	123
Figure (26) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on phosphorus percentage of guar ( <i>Cyamopsis tetragonoloba</i> , L.) plants, during the first and second seasons.	125

<p><b>Figure (27) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on potassium percentage of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<p><b>127</b></p>
<p><b>Figure (28) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on total carbohydrates percentage in the herb of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<p><b>131</b></p>
<p><b>Figure (29) : Effect of compost, vitamin E and some plant extracts (garlic, moringa, aloe and green tea) treatments on total protein percentage in the herb of guar (<i>Cyamopsis tetragonoloba</i>, L.) plants, during the first and second seasons.</b></p>	<p><b>134</b></p>



**SUMMARY**

**AND**

**CONCLUSION**

## **SUMMARY AND CONCLUSION**

This investigation was carried out during two successive seasons of 2014 and 2015, at Abo Qurkas (Kafr Leps village) - Minia Governorate aiming to study the effect of organic fertilization (compost at 2.5, 5.0 and 7.5 ton/fed. as main plot (A) and vit. E (10 and 20 ppm), as well as, some plant extracts (garlic, moringa, aloe and green tea, each at 150 and 300 ppm) treatments as sub-plot (B) and their interaction (A×B) on vegetative growth, yield and yield components, guaran content and some chemical constituents of guar (*Cyamopsis tetragonoloba*, Taub.) plants.

The most important results could be summarized as follows :

### **1- Effect of compost treatments (main plot, A) :**

#### **1-1- Vegetative growth characters :**

The use of compost at all levels significantly increased plant growth characters namely, plant height, stem diameter, number of branches/plant, leaf area, fresh and dry weights of shoots/plant and /fed. as compared with control. The best results of these characters were obtained due to using the medium level of compost (5.0 ton/fed.).

#### **1-2- Nodules/root :**

The low level of compost (2.5 ton/fed.) was significantly superior than other two levels of compost (5.0 and 7.5 ton/fed.) which increased number of nodules/root and their fresh weight/nodules/root.

#### **1-3- Root system :**

The medium level of compost (5.0 ton/fed.) significantly increased fresh and dry weights of roots/plant comparing with other treatments.

#### **1-4- Yield and yield components :**

The three levels of compost (2.5, 5.0 and 7.5 ton/fed.) had significant effect on pod number/plant, number of seeds/ 5 pods, seed number per

plant, weight of 100 seeds, seed yield/plant and per fed. Fertilizing guar plants with medium level of compost (5.0 ton/fed.) gave the maximum values for all studied characters comparing with other treatments.

### **1-5- Chemical constituents :**

#### **A- Guaran productivity :**

Supplying guar plants at any level of compost (2.5, 5.0 and 7.5 ton/fed.) caused an increase in guaran % and guaran yield/plant and /fed. The maximum values were obtained by the medium level of compost (5.0 ton/fed.).

#### **B- Photosynthetic pigments :**

All used treatments of compost led to significant increase in chlorophyll a, b and carotenoids contents as compared with control. The maximum contents of chlorophyll a, b and carotenoids were obtained by the medium level of compost (5.0 ton/fed.).

#### **C- N, P and K (%) :**

The medium level of compost (5.0 ton/fed.) significantly increased N, P and K % in the leaves as compared with other treatments.

#### **D- Total carbohydrates (%) :**

The three levels of compost (2.5, 5.0 and 7.5 ton/fed.) significantly increased total carbohydrates (%) in the herb of guar as compared with control. The best treatment was 5.0 ton/fed. compost.

#### **E- Protein (%) :**

The best treatment which produced the highest percentage of protein in the herb was compost at medium level (5.0 ton/fed.).

### **2- Effect of vitamin E and plant extracts :**

#### **2-1- Vegetative growth characters :**

Spraying plants with vitamin E (150 and 300 ppm) and plants extracts (garlic, moringa, aloe and green tea, each at 150 and 300 ppm)

significantly increased plant height, stem diameter, number of branches/plant, leaf area, shoot fresh and dry weights/plant and /fed. as compared with control, except, green tea at 300 ppm for number of branches/plant, during the second season. Application of garlic extract (300 ppm) followed by green tea extract (150 ppm) then vit. E (20 ppm) registered the best results for these traits.

### **2-2- Nodules/root :**

All ten treatments of vit. E and plant extracts led to significant increase number and fresh weight of nodules/root. The best results were obtained by garlic extract (300 ppm) followed by green tea extract (150 ppm) then vit. E (20 ppm).

### **2-3- Root system :**

All ten used treatments increased fresh and dry weights of roots/plant.

### **2-4- Yield and yield components :**

Application of vitamin E and plant extracts treatments significantly augmented number of pods/plant, number of seeds/ 5 pods, number of seeds/plant, weight of 100 seeds and seed yield/plant and /fed. as compared with control. Garlic extract (300 ppm) and green tea (150 ppm) were superior than other treatments in this concern.

### **2-5- Chemical constituents :**

#### **A- Guaran productivity :**

All used ten treatments of vit. E and plant extracts significantly increased guaran % and guaran yield/plant and /fed. as compared with control, except the treatment of green tea extract at 300 ppm. Among such ten treatments, garlic extract (300 ppm) followed by green tea extract (150 ppm) gave significantly the highest values in this concern over all treatments.

**B- Photosynthetic pigments :**

All treatments of vit. E and plant extracts significantly increased chl. a, b and carotenoids contents over the control. The highest contents of previous photosynthetic pigments resulted from plants which sprayed with garlic extract (300 ppm) followed by green tea extract (150 ppm) without significant differences between them during the first season.

**C- N, P and K (%) :**

The treatment of garlic extract at 300 ppm gave the significant highest percentages of N, P and K in the leaves comparing with other treatments.

**D- Total carbohydrates (%) :**

Spraying guar plants with garlic extract (300 ppm) or green tea extract (150 ppm) gave the highest values of total carbohydrates % in the herb as compared with control.

**E- Protein (%) :**

Using the treatment of garlic extract at 300 ppm gave significantly, over all the highest percentage of protein in the herb.

**3- Effect of interaction (A×B) :**

**3-1- Vegetative growth characters :**

The interaction between compost, vitamin E and plant extracts was significant for all vegetative growth characters. In most cases, fertilizing guar plants with compost (5.0 ton/fed.) in combination with garlic extract (300 ppm) followed by green tea extract (150 ppm) and vit. E (20 ppm) resulted the best results.

### **3-2- Nodules/root :**

The interaction between main and sub plots treatments was non significant for number of nodules in both seasons and fresh weight during the second season.

### **3-3- Root system :**

The interaction was significant for roots fresh and dry weights. The best interaction treatments was compost (5.0 ton/fed.) in combination with garlic (300 ppm) or green tea (150 ppm) in both seasons.

### **3-4- Yield and yield components :**

The interaction was significant for all tested characters. The highest values were obtained by compost (5.0 ton/fed.) in combination with garlic extract (300 ppm) or green tea extract (150 ppm) in all cases.

### **3-5- Chemical constituents :**

#### **A- Guaran productivity :**

The interaction was significant for guaran % and guaran yield/plant and /fed. The best interaction effects were obtained with compost (5.0 ton/fed.) plus garlic extract (300 ppm) or green tea extract (150 ppm) in both seasons.

#### **B- Photosynthetic pigments :**

The interaction was significant for chl. a, b and carotenoids contents in both seasons, except for chl. b during the first season. Generally, the highest contents of pigments were obtained by used compost (5.0 ton/fed.) in combination with garlic extract (300 ppm) or green tea extract (150 ppm) or fertilizing plant with 5.0 ton/fed. compost with garlic extract at 300 ppm.



**C- N, P and K (%) :**

The interaction was significant for N, P and K % in the leaves. The highest N, P and K % was obtained due to compost at 5.0 ton/fed. plus garlic extract at 300 ppm.

**D- Total carbohydrates (%) :**

The interaction was significant for carbohydrates % in the herb. The highest values were obtained with compost (5.0 ton/fed.) in combination with garlic extract (300 ppm) or green tea extract (150 ppm) or compost at 2.5 ton/fed. with garlic extract (300 ppm).

**E- Protein (%) :**

The interaction was significant for protein % in the herb and the best interaction treatment was obtained by used compost at 5.0 ton/fed. in combination with garlic extract at 300 ppm.

**RECOMMENDATIONS**

Under the same conditions of this investigation, it could be recommended that fertilizing guar plants with compost at 5.0 ton/fed. and spraying plants with garlic extract (300 ppm) or green tea extract (150 ppm) or vit. E (at 20 ppm) to improve the plant growth, yield and guaran production.