Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

Effect of Spraying Several Concentrations of Yungrin Leaf Fertilizer on the Growth and Yield of Three Cultivars of Maize (*Zea Mays* L.)

Ali Abed Gatea[1], Mohammed Hassan Hamza[2] and Ali Karim Hussein[2]
[1]Biotechnology Department, College of biotechnology, Al-Qasim green university
[2]Al-Mussaib Technical College, AL-Furat Al-Awsat Technical University, Iraq.

Abstract

A field experiment was conducted in one of the fields in Babylon province to study the effect of adding different levels of yungrin leaf fertilizer on the growth and yield of three cultivars of maize (IPA 5012, Buhooth 106 and Fajer). It was obtained from the Public Authority for Agricultural Research. Use **randomized complete block design (RCBD)** with a system of factorial experiments and three replicates (Al-Rawi and Khalaf Allah, 2000). The experiment included two factors, the first factor concentrations of spraying yungrin fertilizer (25,12.5,0) g per 20 Liter water and symbolized with the symbol (T1, T2, T3) As for the second factor, it includes three cultivars: (IPA 5012, Buhooth 106 and Fajer), and it has a symbol (V1, V2, V3). The results showed are Buhooth cultivars 106 V1) outperformed all studied plant height traits. Cm, leaf area. Cm^2, the number leaves.$Plant^{-1}$, Number of cob. Plant $^{-1}$ and the length of the cob. Cm , it reached (194.42 cm, 6418.33 cm ^{2}, 14.61 leaf.$Plant^{-1}$, 1.61 cob. Plant $^{-1}$ and 19.83 cm). Concentrations (T) showed the spray of yungrin leaf fertilizer significantly superior, as the concentration gave 25 (T3) g. L^{-1} the highest mean of all studied traits (plant height. Cm, leaf area. Cm^2, number of leaves. Cm) amounted to (197.33 cm, 6000.66 cm^2, 14.80 leaf. Plant $^{-1}$,1.56 cob. Plant $^{-1}$and 19.31 cm). The results of the bilateral interaction between the cultivars and the concentrations (V, T) showed a significant effect, as the combination V1 and T3 gave the highest mean in the traits: plant height. cm, leaf area. cm^2 and the number of cob. $Plant^{-1}$, it reached (198.93 cm, 6485.33 cm 2 and 1.90 cob. Plant $^{-1}$) while the combination gave V3 with the control treatment (T1) the lowest average in all traits: plant height. cm, leaf area. cm^2, the number of leaves. $Plant^{-1}$, Number of cob. $Plant^{-1}$ and the length of the cob. Cm as it reached (179.00 cm, 4822.00 cm^2, 12.03 leaf. $Plant^{-1}$, 0.77 cob. Plant $^{-1}$ and 18.00 cm).

Key words: cultivars, foliar fertilizers, maize, yungren fertilizer.

Introduction

Maize is considered an important economic and strategic grain crop at the global level, as it occupies the first rank in terms of cultivated area and production (FAO, 2013) Maize is called the Queen of Grains. High nutritional value, as it contains starch by 73%, protein 9%, oil by 4% and rich in vitamins such as vitamin F and E and also contains other ingredients by 14% (Sobouh et al., 2011). Leafy nutrition is one of the methods that are used to compensate the plant with nutrients as bribes and is characterized by the ease of adding and speed and being economical in the amount of added fertilizers and labor with the possibility of adding them when the symptoms of its deficiency appear on the plant and reduce the risk of environmental pollution (Youssef, 2012) as it is one of the most efficient ways to provide the plant with nutrients In the event of its shortage, which the roots fail to replace, the spray does not compensate for the ground addition, but it is considered a complement to it , Abu Dahi and others (2001) found in a study to know the effect of foliar nutrition with the nutritional (AL-

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

Nahrin)fluid containing a group of elements (N, P ,K Fe, Mn, Zn, Cu) to which boron was added at a concentration of 1 ppm using several levels (spraying with water only) 10 cm3 of liquid And 15 cm 3 of the liquid with boron and several stages of spraying. Significant increase appeared in the number of seeds for broths, weight of 500 grains, per plant share, and total plant yield per tons. Cultivars of maize differ by their response to foliar nutrients due to the difference in the genetic nature and the extent of their environmental and genetic adaptation, and this is reflected in the effect on the growth and yield of the maize (Al-Falahi, 2002 and Paktash and Waheeb, 2004). This study aims to know the best concentration of yungrin leaf fertilizer and cultivars and their interaction, which gives the best yield of Maize.

Materials and methods of work

A field experiment was carried out in one of the fields of the Faculty of Agriculture - University of Baghdad. To study the effect of spraying several concentrations of yungrin leaf fertilizer on the growth and yield of three cultivars of Maize. It was obtained from the Public Authority for Agricultural Research. . Use a Randomized Complete Block Design (RCBD) with a system of global experiments and three replicates (Alrawi and Khalaf Allah, 2000). The experiment included two factor factors, the first concentrations of spraying yungrin fertilizer (12.5,0 and 25) g per 20 l Liter water and symbolized with the symbol (T1, T2, T3) As for the second factor, it includes three cultivars: (IPA 5012, Buhooth 106 and Fajr), and it has a symbol (V1, V2, V3). The experimental plow and its specifications shown in Table (1) with the tipping mower plow, two orthogonal plows to increase soil fragmentation, soften and kill the bush. The area of the experimental unit was 2 * 3 m 2, it contained four lines of distance between one line and another 75 cm and between its joints and another 25 cm separating each repeater from the other with a distance of 1 m and between each experimental unit and another 3 m. Add super fertilizer triphosphate (46%) P2O5 at a rate of 200 kg. A hectare with half the amount of nitrogen fertilizer 150 kg. N ha $^{-1}$ and urea form (46% N) to the soil in one batch before planting, while the second half of the fertilizer N was added when the plant height was 30 cm by distributing the fertilizer as a line 5 cm from the line Agriculture on the one hand only. The experiment was planted on 16/3/2017 and after ten days of planting, the patchwork of the failed hole was performed. And the thinning of plants was done by leaving one plant in –pit 20 days after planting and after the emergence is complete. Use the granulated designation (10% active substance) and 6 kg.ha^{-1} to prevent corn stalk insect and mouthfuls and in two batches, the first is when the plants reach the 6 leaves and the second control after 15 days from the first control , the solutions were sprayed on the vegetative part in the early morning to avoid high temperatures by three sprinkles during the elongation, flowering and filling of the bean stage. A 20 liter dorsal sprinkler was used and a diffuser of liquid soap (al-zaahi) was added by 1.5 cm³ per 10 liters with nutrient solutions (Abadi et al, 2007) As for the control treatment, it was sprayed with water with the diffusion only. The traits of vegetative growth were measured two and a half months after germination. Data were statistically analyzed and averages were compared using the least significant difference at 0.05 (Sahuki and Waheeb, 1990) . used the Genstat program.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

Table (1) shows the physical and chemical properties of the field soil

trait	measuring unit	value
sand	%	18.40
Clay	%	10.88
Silt	%	70.72
soil texture	silt loam	
Total nitrogen	%	1.2
Ready phosphorous	mg L	37.08
Ready potassium	mg L	432.41
Degree of electrical conductivity EC	Deci Siemens $M^{2\ -1}$	7.88
Degree of soil interaction PH		7.6

Table (2) yungren nutrient fertilizer content of nutrients

Element	ratio
N	20%
P	20%
K	20%
Fe	0.025.%
Cu	0.1.%
B	0.015%
Zn	0.01%
Mn	0.01%

*** Youngrin fertilizer was obtained from the local market and is a product in Lebanon within the Belgian SA group.**

Studied traits:

1- **Plant height. Cm**: The height of (10) plants from the soil surface to the top of the male inflorescence of the lines after the male flowering stage was randomly measured from the middle lines.

2- Leaf area (cm^2) : measured according to the following equation, the square of the leaf length under the main cob leaf x 0.75

3- Number of cobs. $Plant^{-1}$: It was calculated from the average number of cobs for ten plants that were randomly harvested.

4- Number of leaves. $Plant^{-1}$: According to after the exit of the male inflorescence and the completion of its formation (Sahuki, 1990).

5- The length of the cob (cm). Measure the height from the area of the broth of the leg to the end of the inflorescence of the broth (Pendleton and Seif, 1962).

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

Results and discussion

Height of the plant. cm

Table (3) data indicates that there were significant differences between the cultivars, as the cultivars Buhooth 106 (V1) was the highest mean characteristic of plant height was 194.42 cm , While the cultivars Fajir(V3) gave the lowest average was 188.82 cm. The reason for this may be attributed to the long growth period from germination to male flowering, as the corn is a limited-growing crop, the height of which stops when the flowering is complete. These results are consistent with what was stated by Aroujo De et al. (2013), Jabouri and Anwar (2009), who found significant differences between Maize cultivars in this trait. While it does not agree with what Yunus and Al-Hassan (2014) found, there are no significant differences between the cultivars for this trait on Maize cultivars. The fertilizer spray concentrations showed a significant effect, as T3 gave the highest average of 197.33 cm, while T1 gave the lowest average of 187.53 cm. Perhaps the reason is due to the effect of nitrogen fertilization, which increases the division and expansion of cells and consequently the increase in plant height, and this is consistent with either Al-Naimi and Al-Falihi (2014, Saadoun and Al-Obaidi (2014) and (Ayub), 2000). Those who observed that there was a significant effect of nitrogen fertilization on this row. The results of the bi-interaction between V and T indicated a significant effect, as the combination V1 and T3 gave the highest mean of 198.93 cm, while the combination of V3 and T1 gave the lowest average of 179.00 cm.

Table (3) Effect of Cultivars and Concentration and Their Interference on Plant Height Traits (cm)

Cultivars	Concentrations of yungrin fertilizer g. L^{-1}			Average cultivars
	T1	T2	T3	
V1	191.87	192.47	198.93	194.42
V2	191.73	189.83	196.73	192.76
V3	179.00	191.13	196.33	188.82
Average concentrations	187.53	191.14	197.33	576
L S D		T=2.94	V=2.94	V*T=5.10

Leaf area.cm^2

Table (4) data showed that there was a significant effect of the cultivars in this trait, as cultivars V1 gave the highest average of 6418.33 cm^2, while cultivars V3 gave the lowest mean of 5278.55 cm^2. The superiority of the genotypes in this trait may be due to its superiority in the height of the plant, and this may have been reflected in the increase in the number of leaves in the plant, which in turn was reflected

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

in the increase in the leafy area. This result was consistent with what was reached(Al-Awadi, 2004 and El-Shatti, Alak, 2008) who found significant differences in the leaf area between the genotypes of the Maize. Concentrations of yungrin leaf fertilizer spray showed no significant effect, as T3 concentration gave the highest average of 6000.66 cm^2, while T1 concentration gave the lowest mean of 5519.67 cm^2. Perhaps it is due to the role of elements, including potassium, which plays a key role in stimulating photosynthesis by increasing the leafy area and activating enzymes no matter what (Wiebold and Scharf, 2006) and this corresponds to what(Ebrahimi et al., 2011) found, adding that the addition of potassium led to The increase in the leafy area and the evidence of the leafy area. The increase in the leafy area is attributed to the role of potassium in delaying the aging of leaves and also to its role in forming a good vegetative group, which is reflected in the photosynthesis process and then increasing cell division, which leads to an increase in the leafy area of the leaves as well as its role in increasing Evidence of Leafy area , the results of Table (4) indicated that there was a significant effect of – interaction between V and T, as the combination V1 and T3 gave the highest average of 6485.33 cm^2, while the combination V3 and T1 gave the lowest average of 4822.00 cm^2.

Table (4) Effect of Cultivars and Concentration and Their interaction in the Traits of leaf area (cm2)

Cultivars	Concentrations of yungrin fertilizer g. L^{-1}			Average cultivars
	T1	T2	T3	
V1	6292.33	6477.33	6485.33	6418.33
V2	5444.67	5581.00	5583.33	5536.33
V3	4822.00	5080.33	5933.33	5278.55
Average concentrations	5519.67	5712.88	6000.66	17233.21
L S D		T=197.69	V=197.69	V*T=342.40

Number of leaves. Plant $^{-1}$

The results of Table (5) showed a significant effect of the cultivars in this trait , as cultivars V1 gave the highest average of 14.61 leaf. Plant $^{-1}$ While cultivars V3 gave the lowest mean of 13.24 leaf. Plant^{-1}. Perhaps the reason is due to the difference in the genotypes between the cultivars and the difference in plant height. Therefore, the late flowering genotype has a greater chance of stem growth and an increase in the number of leaves. These results were consistent with what reached Enujeke (2013). The concentrations (T) of spraying the young fertilizer of yungrin showed a significant effect in this trait, as it exceeded the T3 concentration by giving it the highest average of 14.80 leaf. Plant^{-1}, while control treatment T1 gave the lowest mean of 13.16 leaves. Plant 1- This is due to the fact that potassium

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

encourages the work of more than 60 enzymes, all of which operate at all stages of plant growth, to keep the largest number of leaves in an active state until the end of the growing season, which is reflected in the increase in the number of leaves. The addition of potassium increases the period of vegetative growth, which increases of the number of leaves (Al-Shibiny, 2011). The results of Table (5) indicated a significant effect of bi-interaction between V and T, as the combination V3 and T3 gave the highest mean of 15.37 leaf. Plant $^{-1}$ while the composition gave V3, T1 the lowest mean of 12.03 leaf. Plant $^{-1}$.

Table (4) Effect of cultivars and concentration and their interference in the number of leaves.plant^{-1}

Cultivars	Concentrations of yungrin fertilizer g. L^{-1}			Average cultivars
	T1	T2	T3	
V1	14.03	14.93	14.87	14.61
V2	13.43	13.63	14.17	13.74
V3	12.03	12.33	15.37	13.24
Average concentrations	13.16	13.63	14.80	41.59
L S D		T=0.84	V=0.84	V*T=1.45

The length of the cob. Cm

The results of Table (6) indicated that there was a significant effect of the cultivars on this trait, as the V1 cultivars gave the highest average of 19.83 cm, while the V3 class gave the lowest mean of 18.46 cm. This is due to the genetic differences in this trait, and this in turn varies according to the cultivars by the elongation of internodes and consequently the height of the cob. These results are consistent with (Al-Falahi, 2002 and Paktash and Waheeb, 2004). The concentrations of yungrin leaf fertilizer spray had a significant effect, exceeding the T3 concentration by giving it the highest average of 19.31 cm, while the control treatment gave T1 the lowest average of 18.88 cm. This may be due to the role of zinc in the formation of tryptophan amino acid, chlorophyll and protein, activation of a number of enzymes, and the formation of energy and RNA compounds, which increases plant activity in absorbing water and nutrients, which are reflected positively in plant growth indicators (Fahd et al., 2005). The results of the same table indicated a significant effect of bi-interaction between V and T, as the combination V1 and T2 excelled by giving it the highest mean of 20.20 cm, while the combination V3 and T1 gave the lowest average of 18.00 cm.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

Table (6) Effect of Cultivars and Concentration and Their interaction in traits Length of cob (cm)

Cultivars	Concentrations of yungrin fertilizer g. L^{-1}			Average cultivars
	T1	T2	T3	
V1	19.73	20.20	19.57	19.83
V2	18.93	19.07	19.43	19.14
V3	18.00	18.47	18.93	18.46
Average concentrations	18.88	19.24	19.31	57.43
L S D		T=0.30	V=0.30	V*T=0.52

Number of cob.plant^{-1}

Table (7) data indicates that there was a significant effect of the cultivars on this trait, as cultivars V1 gave the highest mean of 1.61 cob. Plant $^{-1}$While cultivars V3 gave the lowest mean of 1.04 cob. Plant $^{-1}$The reason may be due to the nature of the genotypes among the cultivars, as well as the difference in the quality of the fertilizers (Al-Mutawari, 2002). The concentrations of yungrin leaf fertilizer spray showed significant effect, exceeding the T3 concentration, by giving it the highest average of 1.56 cob.plant^{-1}, while control treatment T1 gave the lowest mean of 1.10 cob.plant^{-1}. Perhaps the reason is due to genetic factors, as well as perhaps due to the role of nitrogen, which affects the number of elements carried by the plant, as well as the fact that nitrogen contributes to increasing the concentration of chlorophyll and thus increasing photosynthesis, as it increases the dry matter by increasing the process of division and expansion of cells Consequently, the plant tends to form more than one cob on the plant , cobs and seeds are the downstream of the plant's dry matter (Nassauer et al., 2007 and Khan et al., 2012). These results were consistent with (Abbasi et al., 2013; Choudhary et al., 2013). The bilateral interference had a significant effect in this trait, as the V1.T3 combination excelled by giving it the highest average of 1.90cob. Plant $^{-1}$ while the composition gave V3, T1 the lowest mean of 0.77 cob. Plant^{-1}.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

Table (7) The effect of cultivars and concentration and their interaction in the characteristic number of cobs. Plant^{-1}

Cultivars	Concentrations of yungrin fertilizer g. L^{-1}			Average cultivars
	T1	T2	T3	
V1	1.40	1.53	1.90	1.61
V2	1.13	1.17	1.47	1.25
V3	0.77	1.03	1.33	1.04
Average concentrations	1.10	1.24	1.56	3.9
L S D		T=0.34	V=0.34	V*T=0.60

References

1. **Abu Dahi, Yousef Muhammad, Ahmad Muhammad Lahmud and Ghazi Majeed al-Kawaz. 2001**. The effect of foliar nutrtion on Maize yield and its components. Iraqi Journal of Soil Science 1) 1): 137-122
2. **Al- Sahuki, Medhat Majeed, Karima Waheeb. 1990**. Applications in experimental design and analysis. Ministry of Higher Education and Scientific Research. Baghdad University. Iraq.
3. **Al-Abadi, Jalil Sabahi; Hamad Muhammad Salih and Hassan Shalash Saadoun. 2007.** Rare elements and bribes on all agricultural crops. Guidance Bulletin No. (41), Republic of Iraq, General Authority for Agricultural Extension and Cooperation.
4. **Al-Awadi, Hussam Fahim Naguib (2004).** The effect of potassium fertilization and control of stem borer on the growth and productivity of two cultivars of maize, Master Thesis, College of Agriculture - University of Anbar.
5. **Al-Falahi, Muhammad Ali Hussein. 2002.** Performance evaluation of some introduced and sweetened hybrids of Maize (*Zea mays* L).
6. **Al-Jubouri, Saleh Muhammad Ibrahim and Arol Muhsin Anwar (2009)**. Effect of different levels and dates of nitrogen fertilizer on the growth of two cultivars of maize. *Zea mays* L.
7. **Al-Nuaimi, Bassam Khumail Abdul-Razzaq and Mahmoud Howaidi Al-Falahi (2014).** The effect of the nitrogen source and zinc spray on the growth and yield of Maize (*Zea mays* L). (2) 12.
8. **Al-Rawi, Khashi Mahmoud and Abdel Aziz Muhammad Khalaf Allah. 2000**. Design and analysis of agricultural experiments, Ministry of Higher Education and Scientific Research. Mosul University / College of Agriculture and Forestry
9. **Al-Saadoun, Sami Nuri Ami and Muhammad Owaid Al-Ubaidi (2014). The response of the Maize** (*Zea mays* L) to organic fertilizing (Pert Humus) under different irrigation periods. Anbar Journal of Agricultural Sciences 12 (2).

10. **Al-Shibiny, Gamal Mohamed. 2013**. Green Fodder Cultivation and Production Technologies Egyptian Library for Publishing and Distribution Egypt.
11. **Baktash, Fadel Younes and Karima Muhammad Waheeb. 2004**. Maize response to levels of nitrogen fertilizer and plant density. Iraqi Agricultural Science Journal 35 (1): 96-85.
12. **El-Matouri, Ahmed Hassan Abdel-Karim, 2002**. Response of Zea mays L genotypes to different levels of nitrogen fertilizer. Master Thesis - Faculty of Agriculture - University of Basra.
13. **Fahd, Ali Abdul-Saif Al-Din Abdul-Razzaq and Kamel Matar Maleh. 2005**. The water requirement of the maize crop in the cultivation of the autumn loop in central Iraq under complete and incomplete irrigation. Agricultural Sciences Studies Volume 32 No. No. 3.
14. **FAO, 2013**. Food and Agriculture Organization outlook.pp.106.
15. **Pendleton , J. W. ,and R.D. Seif .1962. Role of height in Competition. Crop, Sci., 2:154 – 156**.
16. **Shati, Raisan Karim and Makiya Kazem Alak (2008)**. Response response of different genotypes of yellow corn (Zea mays L) to different agricultural distances. Al-Anbar Journal of Agricultural Sciences 6 (2): 97-78.
17. **Sobouh, Mahmoud; Maha Lotfy Hadid; Mukhlis Shahrly and Ahmed Saad El-Din Dabo. 2011..**bringing field crops (practical part), Damascus University Publications, Faculty of Agricultural Engineering.
18. **Wiebold, B. and P. Scharf. 2006**. Potassium deficiency symptoms in drought stressed crops, plant stress resistance and the impact of potassium application south china. Agron. J. 98: 1354-135.
19. **Youssef, Diaa Boutros. 2012.** The guide in the cultivation of maize. Al Diwan Printing Company, Ministry of Science and Technology.
20. **Yunus, Salem Abdullah and Abbas Medi Al-Hassan (2014)**. Effect of planting dates and plant density on the growth traits and yield of two cultivars of maize. Iraqi Agricultural Journal of Commons. 45 (8) (special issue): 865-875.
21. **De Araujo, AV. Brandao, DD. Ferreira, ICPV. Da Costa, CA. Porto, BBA. (2013).** Agronomic performance of landrace and hybrid maize cultivars cultivated under different management systems . Rev . Ciene . Agron. 44(20: 885-892.
22. **Ayub, M.,M. Addilchoudhry, Asif Tanveer, M. M. Z. Ahmad (2000).** Effect of Different nitrogen and phosphoeus sources on the growth and grain of maize (**Zea mays L.)** . Pakistan Journa biological science . 3(8); 1239-1241 .
23. **Abbasi K. Tahir M. Mahmood and R. Nasir (2013).** Effect of N fertilizer source and timing on yield and N use efficiency of rainfed maize (Zea mays L.) in Kashmir-Pakistan. Geoderma J. 195(87): 87-93.
24. **‹S. K. Singh ‹D. ‹Choudhary. ‹Chaudhari R.S.R. Mahala and R. L. Dadarwal (2013).** Effect of nutrient management on growth and yield of quality protein maize (Zea mays L.). Res. on Crops J. 14(3): 743- 747.
25. **‹Nassaue r J. I. M. V Santelmann and Donald Scavia (2007). From the Corn Belt to the Gulf: Societal and Environmental Implications of Alternative Agricultural Futures (Rff Press**). 1st edition. Pub: Routledge. PP: 272.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 11946 - 11955
Received 05 March 2021; Accepted 01 April 2021.

26. **Enujeke E. C. 2013**. Effects of cultivars and spacing on growth characters of hybrid maize. Asian Journal of Agriculture and Rural Development, 3(5) 2013: 296-310. **Ebrahimi, S. T., M. Yarnia, M. B. K. Benam and E. F. M. Tabrizi. 2011.** Effect of potassium Fertilizer on corn yield (Jeta cv.) under Drought stress condition. Am – Euras. J. Agric & Environ. Sci., 10(2): 257 – 263.
27. ‹ **Khan S. A;A Khan and H. U. Rashid (2012).** Maize Production: Impact Of Plant Population And Nitrogen Levels On Maize Yield. Pub: LAP LAMBERT Academic. PP:92.