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The Effect of The Hierarchy of Tiller Production In Wheat Under The Influence of Seed Rates And Nitrogen Levels

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Abstract:*A Factorial experiment was conducted at the Experimental Station (A) of the Field Crops Department / college of Agriculture - University of Baghdad (Jadriya) during the winter season of 2014-2015. The study aimed to investigate the effect of the hierarchy of tiller production in wheat under the influence of seed rates and nitrogen levels. Treatments were distributed in the Factorial experiment within Randomized Complete Black Design with three Replicates and four seeding rates 60,80,100 and 120 kg ha-1 and fertilized with four nitrogen levels 50,100,150 and 200 kg N. ha^{-1}. The results showed that there were significant differences within two factors and their interactionwith the number of fertile tillers m-2 (the first tiller T1, the second tiller T2, the third tiller T3). m^{-2}, dry weight (gm) and plant height (cm) during the growing season.As the main stem superiority to give the highest average of number of fertile tillers m^{-2}72.7 spikes. m^{-2} and dry weight were 15.131 (gm) and plant height was 76.18 cm compared to other primary (tiller1, tiller2, tiller3) which amounted to 167.54 tillers. m^{-2} 5.39 (g) and 54.41 (cm) respectively. Concerning seed rates were higher than 80 kg. Ha in giving the highest average number of fertile tillers. m^{-2} reached 181.77 tillers. Fertile. m^{-2} did not differ significantly from the seed rate 100 kg. Ha, which reached 174.57 tillers. Fertile. m^{-2} while the seed rate exceeds 60 kg. Ha in giving the highest average dry weight (gm) and plant height (cm) was 2.28 g and 64.03 cm respectively compared to the rest of the other seed rates. The Nitrogen levels have exceeded 150 kg N.ha, gave the highest average number of fertile tillers. m^{-2} 182.1 fertile tillers. It did not differ significantly in the level of 100 kg. N. ha, which gave an average of 164.25 tillers. Fertile.m^{-2} compared to the rest of the levels, while dry weight and plant height exceeded the level of 100 kg, giving the highest average of 2.362 g and 64.2 cm respectively compared to the rest of the levels. Conclude that the total contribution rate of the primary tillers is half the total number m^{-2}. Within two factors study, seeding rates and nitrogen levels behaved differently in their effect on the main stem and primary tillers. The older tillers also gave the highest contribution rates compared to the higher tillers in the composition. The lowest seed rate also gave the highest average dry matter accumulation and the average number of fertile tillers. m^{-2}.*

Keywords:*the hierarchy of tiller production, the contribution of main stem, Tiller1, Tiller2, Tiller3, Dry weight tillers, Tiller height * Part of M.Sc. Thesis of the first author.*

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I. Introduction

The production of important qualities in a lot of cereal plants such as wheat because of their ability to grab a maximum of light all and grain production through operation such as breaking dormancy who. Shoots and tillerdevelopment, aging tillers being greatly affected adjectives tillers. **(Lafarge and Hammer, 2002 and Evers etc. 2006).** Depends the emergence and development of tillers and continue with life on the intensity of competition within a plant community. **(Almeidaetc,2004).**Usually the main stem emergesbefore the rest of the tillers being the former in composition. As well as having a greater chance or opportunity to stay alive compared to other tillers it to the main stem of great importance since through it to know the number of seeds growing from the total number of cultivated plants, as well as having the highest weight and number grain spike thus higher than of other tillers. **(Hucl and Baker, 1989**).Suggested **Klepperetc. (1982and 1983a)**the main axisscale, which uses the leave diameters and mainstem in harming tillers. The first stem that emerges from the seed is the main stem (m.s.And the subsequent).Stems can be considered primary, secondary and tertiary tillers, depending on the mainstem. The tillers that leave from the axillary buds of the main stem leaves are indicated by the letter and then by the number. The number of the initial section is composed of single number indicating. The number of the leave to which the original bud is associated. For example, the tiller (T1) of the first leaf on the main stem is given and secondary tillers are given a two number, or including the first tiller and the second number refers to the number law, for example: tiller (T21) it is the tiller of the apparent first leave for the first tiller (T2).This systemcontinues to the three tillers, and the number, then, consists of three numbers and so on.

The second source of the tillers is the coleoptile tiller which appears under the surface of the soil at the base of the coleoptile tiller it symbolizes either (TO) or (TC),**(Gulnaz,etc., 2011)**. **Thiry, etc. (2002a)**Defined it as the growth of the buds in the leaves of the leaves of the plant while **(Tilly,etc.2010)** explained that the tiller is a lie that arises from the contract on the main stem of the mother (mother shoot) or main stem (M.S). And over time grows and develops and actirates until it reaches the reproductive stage and the number of tillers produced by the plant comes from the introductionof environmental factors and crop management. The main stem contributes 30-50% of the grain yield, while the fertile tillers contribute 50-70%,**(Thiryetc. 2002a).**The fertilization process is important in determining the suitability of the species to specific environments. **(Hucland Baker, 1990)**.The determination of the seeding rate in one of the most influential processes in the grain and other traits. The optimal plant density achieves the highest yield of the different genotypes. It is important to find the appropriate relationship between cultivated genotype and other important traits such as 1000 grain**(Valerio etc. 2009).**Found**(Garcia del Moral, etc.2005)**A natural relationship between vegetative growth and the highest number of tillers. In Australia, the strategy of adopting high seed rates for farmers as a component of integrated management of bush control has become widely accepted, but high seed rates do not necessarily result in high plant field. High seed rates do not always give high vegetation densitions enough to compete with the seed**(Falconer and Sharma, 2006).**The availability of nitrogen is sufficiently related to related to the effectiveness of photosynthesis, strong vegetative growth and darken color, and is important in the use of carbohydrates**(Ali etc., 2005).** In general, the increase in wheat for different, varieties increases with nitrogen **(Beheraetc. 2000)**. Nitrogen in the plants is absorbed in two forms, nitric (No_3) and ammonium (NH_4) **(Ali, 2007 and Albazetc., 2008).**The importance of nitrogen use is to be added by developers on the optimal times and evolution that coincides with the stages of formation and growth of components of the product, which avoids the exposure of the plant to any food stores that will limit the development of ingredients and then the final yield **(Jaddoa, 2015).**

Al Hassan, (2011)concluded that the gradual availability of nitrogen at the sometime led to an increase in photosynthesis that may have reduced the competition between the main stem which started with its rapid acceleration and between the tillers themselves to provide food support necessary for the growth and the emergence of the largest number of tillers produced until the end of the season and give the tillers with the ears. Which reflected positively in increasing the number of years. The precise tillers between the amount of nitrogen and the date of the additionof the plant is necessary to achieve the highest granular content with the main stem amount of added nitrogen. **(Al-Hassan, 2011)**to know the pattern and the possibility of subdivision of several varieties by the reach the best varieties and linked to the need of fertilizer Sec the turning capacity. The aim of this research organization in active influence wheat tilleringto main seeding rate and nitrogen levels to know the contribution of primary tillers tiller, tiller2 and tiller3 on grain production.

II. Materials And Methods

This experience is applied in a testStation (A) stations, college of agriculture university of Baghdad (Baghdad Campus) during the winter season (2014-2015) in the loam to study the effect of seeding rates and nitrogen levels and the contribution of each of the main stem and primary tillers (T1, T2 and T3) in the grain of wheat. Random samples of soil were taken at a depth of (0-3) cm before planting. And analyzed of the college of Agriculture, University of Baghdad and the results of the analysis as shown in table (1). The design of (R.C.B.D) (random complete block design) according to the order of the global experiment using three replicates. The study included two factors seed rates of four levels. (60 , 80 , 100 and 120) kg/ha. The nitrogen fertilizer at four levels is (50 , 100 , 150 and 200) kg N ha. Soil preparation and soil service prior to planting were carried out by cleaning and removing the residues of the previous crop and plowing the soil. The two plots were perpendicular to the plow, and the soil was softened by disk activity. Nitrogen levels between experimental units. The total area of each experimental unit is 4 square meters (2*2) square meters.Each experimental unit consisted of 10 lies with a length of 2 meters and length of cultivation between the lines 20cm and a depth of planting 5 cm. It was equipped with 480 bags of seed rates each line has its own seed quantity by one (2.4 , 3.2 , 4.0 and 4.8) gram of seeds sequentially within seed rates.

The soil of the experiment was submerged with superphosphate fertilizer (P_2O_5) 46% before planting at a rate of 100 kg ha. Add one batch of 200g per experimental unit**(Jaddoa, 1995).** Use urea fertilizer (N, 46%) was used, and the share of a unit of experimental unit was calculated by the levels of the students (10.869 , 21.739 , 32.68 and 43.478) by a gram of each level. It was added in accordance with the evolutionary criterion of the plant in first four batches at the planting ZGS: 01 (Zadoks Growth stage) and the second on the stage of the growth of (ZGS: 13) (of the plants, possession for three full leaves on the main stem) and the third at (ZGS: 32) (at the elongation phase the emergence of two nodes on the main stem) and fourth ZGS: 40 (of the booting stage) level on a scale **(Zadoks etc. 1974).**The date of sowing, of history 25/11/2014. The first reason was given, and after the completion of the germination process for all experimental units within the study percentage

of 100%, which ranged between 7-10 days and after the plant possession of two leaves (full Expanded) (ZGS:12) on the main stem.

One line of each experimental unit was observed from the four sides, corresponding to one sample in all experimental units, 5 randomly selected plants were selected from the four sides to study the growth characteristics of each of the mainstem and first tillers and second tillers and the third tillers. As each plant was thought to distinguish from the other plant (non-index) with an orarye rubber table with 1-inch diameter. Tillering were (T1, T2, T3) (Tiller1, Tiller2, Tiller3) taught when each of them appeared on the plant were also marked with rubber marks of 0.5 on in different colors and shapes (white mark is open – A black checkered mark- Unsweetened black mark). The ground of the experiment was irrigated according to need and the control of the high weeds with the chevalier was within the optimum time for spraying **(Ahmed, 2005).**

Table 1 Some physical and chemical properties of the soil of the experiment before planting.

Carestaracter	Season
	2014-2015
Soil separation of soil. GM. Kg^{-1}	
Sand	272
Cly	388
Silt	340
Soil tissue	Clay loom
($_{P}$H)	7.24
EC_e ($dS.m^{-1}$)	2.37
Nitrogen ready mg. Kg^{-1}	20.1
Phosphorus ready mg. Kg^{-1}	14.33
Potassium ready mg. Kg^{-1}	85.0
Organic matter %	0.86

Studied Qualities:

Number of tillers square meters:

The number of tillers of plant taken from the line was calculated asa distance of 50 cm length per experimental unit, and converted to a square meter.

Dry weight at maturity of tillers (g): taken dry weight at harvest for each of (main stem), Tiller1, Tiller2, Tiller3, the roots were cut from the plants located 50 cm length for each experimental unit with a sensitive tiller after counting the tillers.

Plant height (cm): measure the height of the plant after harvest with a measuring ruler included from the base of the plant until.

III. Result Anddesiccation

Effect of seed rates and nitrogen levels on growth characteristics

Number of fertile tillers (T1, T2, T3) m^{-2}

Total number of grains depends on a number of factors, including the number of tillers, which is the most important for its contribution in increasing the number of squareneters and then increase the final number. **(Aqbeletc. 2012).** Analysis of variance analysis indicates (5) and table (3) data seed rates was significantly affected by the number of tillers (T1, T2, T3) square meters. The increase in seed rates is less than the total number of tillering per square meter. This is evident in figure 3 which shows an average height of 60kg. ha significant in giving the highest average staggered score 202.50 tiller square meters and the percentage increase of2.8 , 20.57 and 45.671. Compared to route 80.100 and 120 kg.ha sequentially, which gave averages 196.83 , 160.83 and 110.00 tiller square meters. While the opposite was observed in table 4.Which shows the increase in the number of main stems in square meters by 210.00 main stem square meters increasing the seed rates 60 kg.haWhich gave the lowest average of this capacity amounted to 125.80 main stems in square meters, due to the fact that of low seed rates less plant density in the unit area, the number of the main stems tillers due to lack of competition for food. High seed rates the competition for food is increasing, so the plant subsides and the number of stems increases in the area.

As for the levels of nitrogen, table 4 , 5 and figure 4 are above 150kg N.hasignificant in giving the highest average number of tillers (T1, T2, and T3) square meters amounted to 1750.00 square meters as well as giving the highest average number of mainstem square meters amounted 189.20 main stem square meters increase of 12.38 and 17.65% sequentially. Compared to the level 50kgN.ha which gave the lowest average number of tillers and a number of main stems amounted to 153.33 tiller square meters and 150.80 main stem square meter sequentially. But did not differ significantly from the level 200kg nitrogen per hectare, which gave

an average number of main stems amounted to 173.33square meters and 185.80 main stem square meter in succession.

This can be attributed to the important and the important role of nitrogen in plants. Since its addition in the early stages of the plant life leads to increased vegetative growth and thus increase the efficiency of intercepting the sun, which leads to the increase of the materials manufactured and sent to the initiators of continuity for the continuation of growth and prolong the production of tillers that the addition at the stages of the extension leads to a decrease in the death rate of tillers. This is in line with what **(Islam, etc. 2007, alHassan 2011, Khalid etc. 2014 and Jaddoa, etc. 2017).** The introduction between the two study groups gave the formula 60kg seed with 200kg. N and 80kg with 100kg.N higher than the average grade of 223.33 tiller square meters with an increase of 67.16% for the synthesis of 120kg seed with 200kg.N for this grade reached 73.33%. Annex 6 shows the existence of an appositive correlation relationship with several characteristics, if the highest correlation value of this function is recorded with the biological value of the second tiller amounted to (r=0.896).

Table2, Effect Of Seed Rates And Nitrogen Levels In Number Of Fertile Tillers (T1, T2, And T3)

mean	Levels of nitrogen (kg.ha)				Seed rates (kg.ha)
	200	150	100	50	
202.50	220.00	216.67	223.33	150.00	60
196.83	206.67	223.33	180.67	176.67	80
160.83	193.33	130.00	123.33	196.67	100
110.00	73.33	130.00	146.67	90.00	120
4.25	8.50				l.s.d.5%
	173.33	175.00	168.50	153.33	mean
	4.25				l.s.d.5%

Table 3, the effect of seed rates and nitrogen levels in the number of **main stems per square meter.**

mean	Levels of nitrogen (kg.ha)				Seed rates (kg.ha)
	200	150	100	50	
125.80	170.00	130.00	96.70	106.70	60
166.70	143.30	213.30	153.30	156.70	80
188.30	200.00	176.70	193.30	183.30	100
210.00	230.00	236.70	196.70	176.70	120
11.81	23.62				l.s.d.5%
	185.80	189.20	160.00	155.80	mean
	11.81				l.s.d.5%

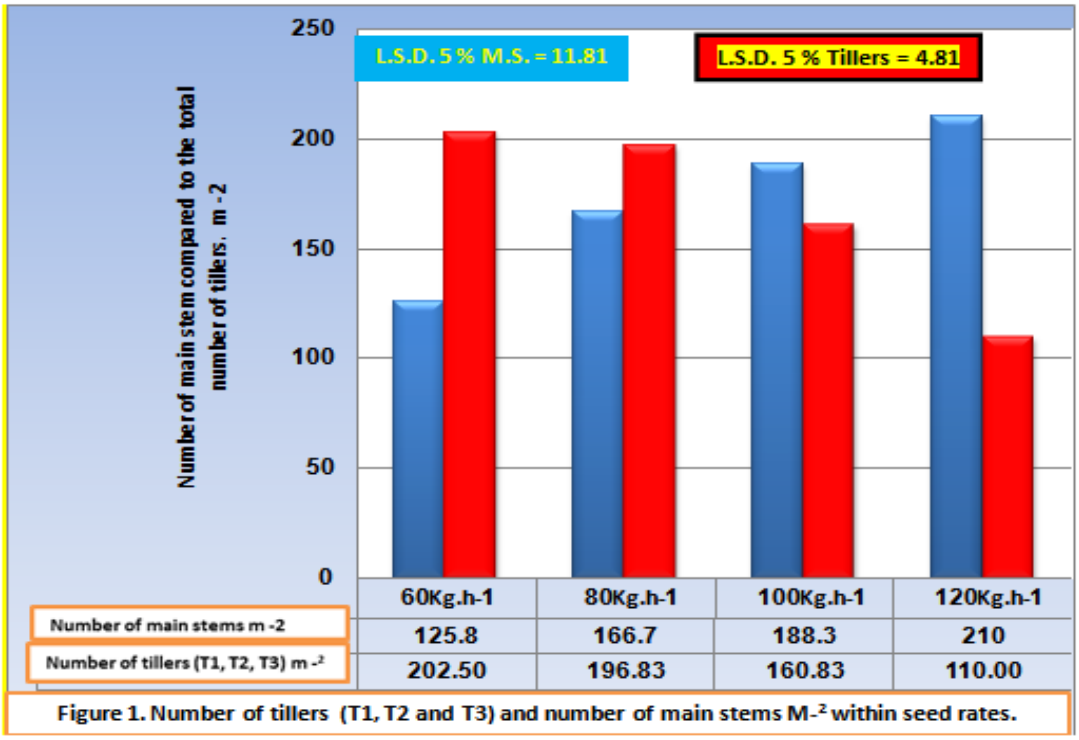


Figure 1. Number of tillers (T1, T2 and T3) and number of main stems M-2 within seed rates.

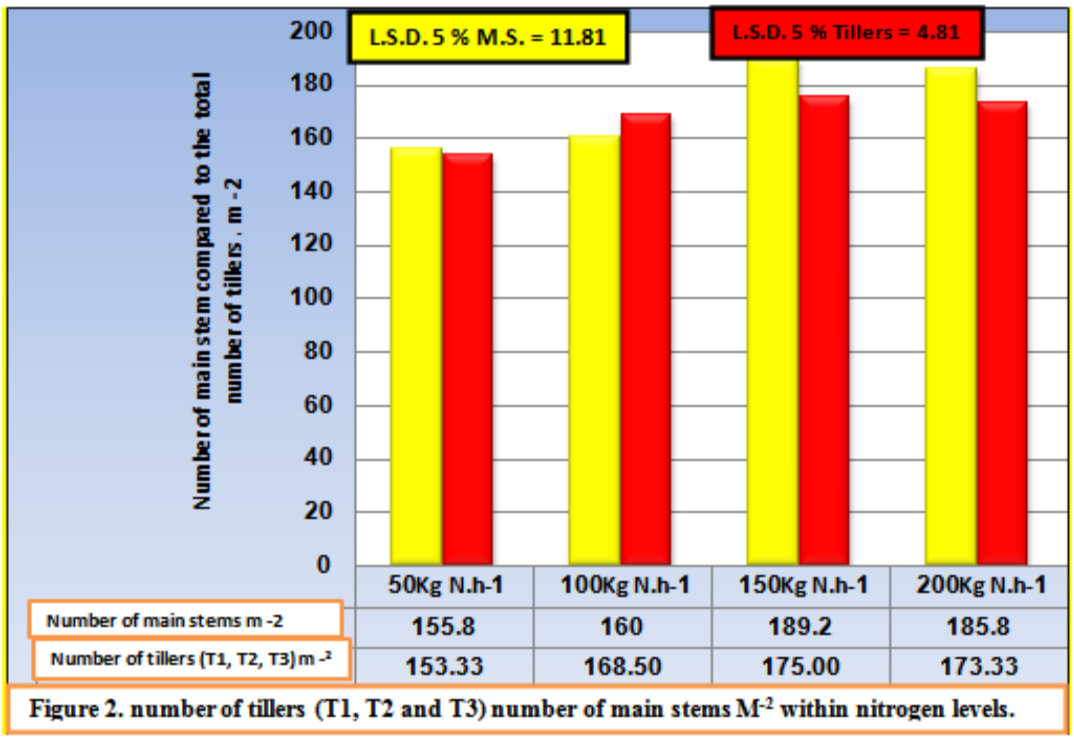


Figure 2. number of tillers (T1, T2 and T3) number of main stems M-2 within nitrogen levels.

Dry weight : (gm.)

Dry matter is the difference between construction and demolition with the rate of carbon representation. The analysis of variance in annexes 1 , 2 , 3 and 4 and table 6 shows the rates of seed and nitrogen levels and their introduction significantly affected the final dry weight of the main stem (M.S) and tiller one (T1), tiller two (T2) and tiller three (T3).

Main stem (M.S)

Table (6) and figure (7) show that increased seed rates have led to increased dry weight increase of M.S, the seed rate gave 120 kg per ha higher than the final dry weight was 4.099 g, significantly higher than the other seed rates of 60 , 80 and 100 kg Ha in which the final dry weight dropped by 14.49 , 11.91 and 5.17

respectively, averaging 3.505 , 3.640 and 3.887 g respectively.The level of nitrogen has significantly affected this in the form of main stem, as a figure (8) exceeds the level of 100 kg was significantly higher, with a mean yield of 4.122g an increase of 12.98% compared to 200 kg which gave the lowest average of this status was 3.578g. With regard to the interaction between seed rates and nitrogen levels, the mixture gave 120 kg seed with 100 kg of higher nitrogen fertilizer at a rate of 4.605g, while the combination gave 60 kg seed with 200kg less intermediate fertilizer of 3.158 and a decrease of 31.421 or adjust an annex (6) indicates that there is a positive correlation with Serial characteristics, giving the highest value of the weight of the second tiller (0.828).

Tiller one (T1):

able (6) shows, The effect of seed rates on final dry weight of T1 followed a similar behavior in this effect on this character is it off the main stem. Figure (7) confirm that the seed yield is 60 Kg/ha with a mean yield of 2.669, compared with seed rate 80,100, and 120Kg. Ha, The lowest mean was 120Kg. Ha it was 1.516g a decrease of 43.19%. However, nitrogen levels significantly increased. As figure & shows, the final dry weight of T1 decreases with increasing or decreasing the nitrogen levels from 100Kg.N.ha, which was significantly higher with a mean of 2.239g, compared with the other levels 50,150 and 200 Kg.N.ha which gave the averages 2.083 and 2.159 and1.794 g respectively and a decrease of 696, 3.57and 19.87 in succession, As for introduction between the two study groups, The combination was 60 my seed with 150ms nitrogen fertilizer with the highest mean of 2.998(g) with an increase of 79.99%. Compared to100Kg seed with 200Kg fertilizer, the capacity was 0.600g. Table (6) shows a positive correlation with several characteristic and the highest correlation with dry weight was mean stem (r=0.728).

Tiller two (T2)

Table (6) and figure (7) confirm that the threat by increasing seed rates. The final dry weight of T2 decreases. The average of 60Kg.ha gives the highest average 2.045g, significantly higher than the other seed rates 80,100 and 120 Kg.ha with an increase of 36.43, 44.74, 761,51% in succession.The levels of nitrogen are shown in figure (8) the level is 100Kg, nitrogen ha. The highest average yield was 1.797g with a significant yield of 200Kg nitrogen per hectare, which gave a mean average of 0.955g a decreased of 46.85%, while the levels of 50 and 150Kg of nitrogen decreased by 32.29 and 27.89%. Respectively giving an average of 1.379 and 1.295g respectively. As for the introduction between the two studies, The combination of 60Kg with a maximum of 100Kg of nitrogen significantly increased with a mean of 2.541g compared to 120Kg seed with 200Kg nitrogen fertilizer, which accounted for 97.83y. In this capacity amounted to 0.50 Table (6) confirms the existence of a positive correlation relationship with several characteristics and recorded the highest correlation value when the dry weight of the main stem was (r=0.828).

Tiller three (T3)

Table (6) shows that seed rates in this category of T3 have similar behavior in this category for (MS, T1 and T2) figure (7) shows that the final dry weight of T3 decrease with increasing seed rates. The highest average of this characteristic at seed rate 60 mg.ha Was 0.911g while the have average 120Kg. The rate of being 0.328 and a decrease of 63.99, while the seed rate of 80 and 100 Kg.ha decreased by 9.22y and 37.797, respectively with a mean of 0.827 and 0.567g respectively. The levels of nitrogen (figure 8) were higher than 100Kg.ha of nitrogen per hectare. The highest mean was 0.803g with a significant improvement in the rest of the levels.

With a decrease of 41.59y while the levels gave 150 and 200 Kg nitrogen of this capacity amounted to 0.684 and 0,678g respectively and did not differ significantly between them.

The highest correlation value with the biological value of the second tiller was (0.815).

In the light of the above, based on the data in table (6) it was found that what seed rates were increased the dry weight of the main stem increases, while the dry weight of T1, T2, and T3, Tiller decreases significantly increased rates of seed, has been attributed to the production of dry matter in wheat the extent of their objection (capture) to the sun of and the efficiency of the use of that radiation and converted to dry matter.This is strongly affected by the plant density of the area unit. Thus, that lower seed rates, the competition between the main stem and the Tiller on another is reduced by the nutrient and plants' ability to capture as such light as possible and turn it into dry matter, that was agreed with the result**.Lerner and Satorre 1990, and seleiman etc., 2010 and**

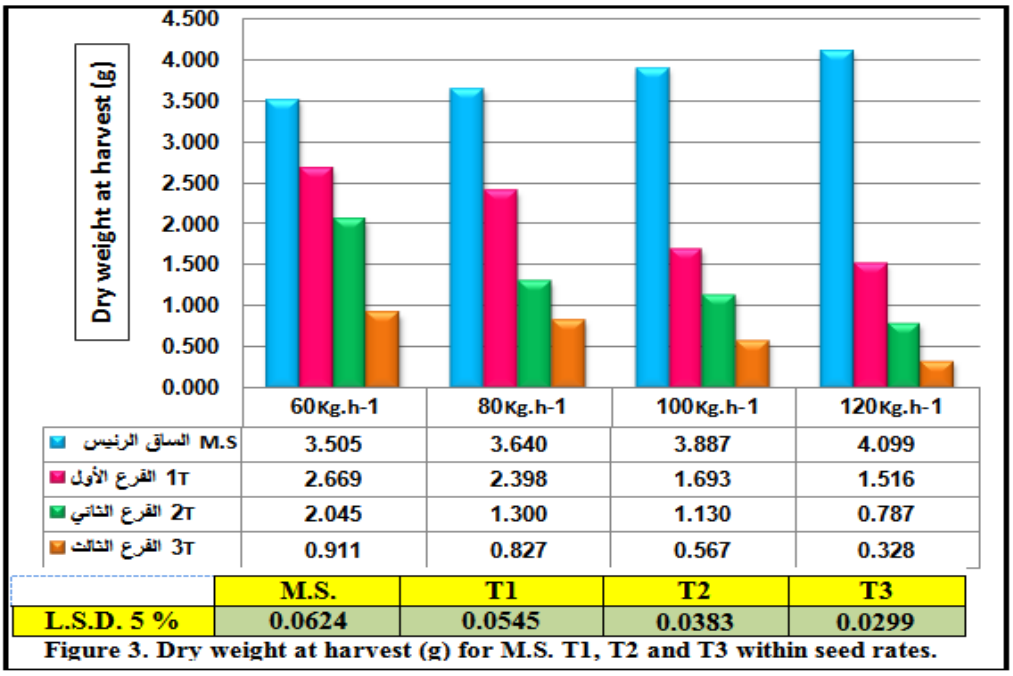
Al-Hassan, 2011.

However, nitrogen levels are higher than looking N1.ha at 50Kg nitrogen levels. With the highest dry weight of MS and T1, T2, T3. (Table6). This may be due to its role in the plant as it increases the size of the leaf and extends the lengthens its an increase in the size and duration of vegetation. Survival of the crop. Then produce high rates of dry matter, as well as, its superiority by given the highest average height of the plant. The

reason for its superiority is high levels of nitrogen 150 and 200 Kg. Nitrogen ha added to the optimum, which may lead to a lack of accumulation of dry matter in the plant, and spent it with what reached him **wen-mingetc., (2006).**

Table 4. Effect Of The Two Study Factors On Dry Weight (Gm) Of The Main Stem And Tillers**.**

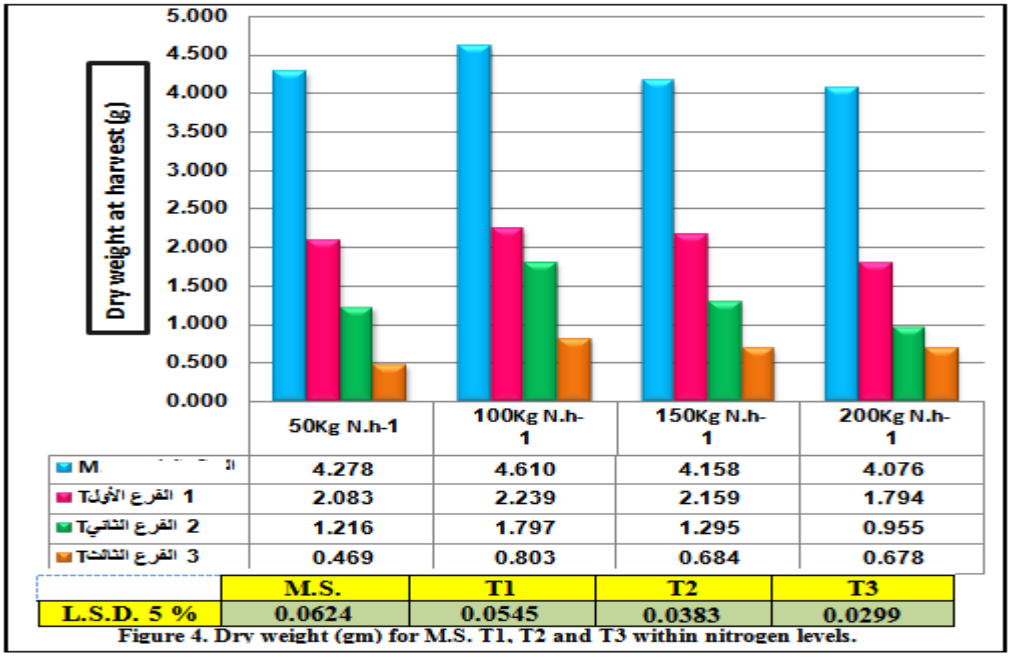
mean	Levels of nitrogen (kg.ha)				Seed rates (kg.ha)	
	200	150	100	50		
3.505	3.158	3.208	3.641	4.014	60	Main Stem (M.S.)
3.640	3.336	3.667	4.089	3.468	80	
3.887	3.864	3.704	4.114	3.867	100	
4.099	3.955	4.063	4.605	3.774	120	
0.0624	0.1248				%5.l.s.d	
	3.578	3.660	4.112	3.780	mean	
	0.0624				%5.l.s.d	
2.669	2.825	2.998	2.639	2.215	60	Tiller one (T1)
2.398	2.375	2.671	1.859	2.687	80	
1.693	0.600	2.103	2.579	1.489	100	
1.516	1.378	0.865	1.879	1.942	120	
0.0545	0.1090				%5.l.s.d	
	1.794	2.159	2.239	2.083	mean	
	0.0545				%5.l.s.d	
2.045	1.618	2.132	1.889	2.541	60	Tiller two (T2)
1.300	1.810	0.796	1.517	1.079	80	
1.130	0.336	1.617	1.706	0.861	100	
0.787	0.055	0.634	1.423	1.035	120	
0.0383	0.0767				%5.l.s.d	
	0.955	1.295	1.634	1.379	mean	
	0.0383				%5.l.s.d	
0.911	0.851	1.104	1.341	0.348	60	Tiller three (T3)
0.827	1.271	0.493	0.593	0.951	80	
0.567	0.590	0.231	1.067	0.379	100	
0.328	0.000	0.907	0.211	0.196	120	
0.0299	0.0598				%5.l.s.d	
	0.678	0.684	0.803	0.469	mean	
	0.0299				%5.l.s.d	



	60Kg.h-1	80Kg.h-1	100Kg.h-1	120Kg.h-1
M.S الساق الرئيس	3.505	3.640	3.887	4.099
1T القرع الأول	2.669	2.398	1.693	1.516
2T القرع الثاني	2.045	1.300	1.130	0.787
3T القرع الثالث	0.911	0.827	0.567	0.328

	M.S.	T1	T2	T3
L.S.D. 5 %	0.0624	0.0545	0.0383	0.0299

Figure 3. Dry weight at harvest (g) for M.S. T1, T2 and T3 within seed rates.



	50Kg N.h-1	100Kg N.h-1	150Kg N.h-1	200Kg N.h-1
M	4.278	4.610	4.158	4.076
1 القرع الأولT	2.083	2.239	2.159	1.794
2 القرع الثانيT	1.216	1.797	1.295	0.955
3 القرع الثالثT	0.469	0.803	0.684	0.678

	M.S.	T1	T2	T3
L.S.D. 5 %	0.0624	0.0545	0.0383	0.0299

Figure 4. Dry weight (gm) for M.S. T1, T2 and T3 within nitrogen levels.

Plant height:

Analysis of variation in Table (2,3 and4) and the results of Table 5 indicates significant differences between seed rates and nitrogen levels and they overlap in their effect on plant height for each of the first Tiller (T1) and the second Tiller (T2) and the third Tiller (T3), but the main stem (MS) (Table) the seed rates was not significantly affected.

Main stem (ms):

Table (5) shows that the height of the main stem was not affected by seed rates, there were no significant differences in this status and this was agreed with the result **Naveed etc, (2014)**of this study did not show significant differences of this attribute by increasing seed rates. Nitrogen levels were higher than 100 Kg N ha, giving the highest average height of the head 77.67 cm compared to the level of Kg N ha. Which gave the lowest average of this capacity was 73.84 cm, with a decrease of 4.93y. While the levels of 50 and 150Kg gave an average N ha of 76.45and 76.74 cm and did not differ significantly between them. Figure (6) shows the height of the main stem by effect of nitrogen levels.

The introduction between seeding rates and nitrogen levels had a significant effect on the main stem. As the treatment gave 100 Kg seeds with 50 Kg fertilizer higher than the height of the main stem was 81.91 cm. Was significantly superior to the combination of 80 Kg seeds with 200 Kg N fertilizer, which gave the lowest average of this capacity was 70.51 cm and a decrease of 13.91% Table (6) shows a significant positive correlation between the height of the main stem and several characteristics, with the highest correlation value if this characteristic with a weight of 1000 grams for the Tiller third period (r=0.528).

Tiller one (T1):

As shown in Table (5) and figure (5), seed rates differ significantly in their effect on the height of the first Tiller. The average of 100 Kg ha gave the highest average height of the first Tiller at 72.41 cm, which was significantly higher than the rest of the seed rates of 60.80 and 120 Kg.ha. An increase 0f 5.86 , 200 and 9.25y sequentially. The lowest average height of T1 was recorded at the seed rate of 120 Kg.ha of 65.71 cm. This may be due to the ability of the first Tiller (T1) to competition other Tillers (within one plant) in high plant densities being the former in composition compared to the second and third Tillers. As appearance is after a short period. From the emerge of the main stem.

In terms of nitrogen levels, the level of 100 kg N-1 was higher than the highest T1 height of 71.34 cm. This was evident in Fig. 6, while the T1 was significantly reduced at 150 and 200 kg N-1 with 67.87 and 66.89 cm sequentially, with a decrease of 4.86 and 6.23% sequentially, but did not differ significantly from the level of 50 kg N. e -1, which gave an average of 71.14 cm.The correlation between the two factors significantly affected this effect. The combination was 80 kg seed yield with 50 kg N fertilizer by giving the highest mean of T1 height of 75.14 cm with an increase of 28.44% compared to the combination of 120 kg seed with 200 N fertilizer which gave the lowest average This figure was 53.77 cm. Annex 6 shows the existence of a positive correlation relationship with several characteristics, namely the dry weight of the main stem, the number of spikes for the first branch, the number of saplings for the second branch, and the harvest guide for the second branch. The correlation coefficient (r=0.302 –r=0.301 –r= 0.503 –r= 0.408) was sequenced.

Tiller two: (2)

The data in Table 5 and Figure 5 indicate that the seed rates differ in their effect on the height of the tiller 2. The seed rate gave 80 kg ha the highest average height of the tiller2 at 64.70 cm, which significantly exceeded the seed rates of 100 and 120 kg. Ha with an increase of 7.99 and 10.58% sequentially, but did not differ significantly from the average 60 kg. Ha, which gave an average height of the tiller2 was 62.62 cm. This may be due to the lack of mutability (between plants on the one hand and between the main stem and the rest of the tillers within one plant on the other) in lower seed rates, which encourages the plant to produce the tillers 2 and tillers3, and therefore the increase in seed rates is higher than the high seed rates. For nitrogen levels, Table 5 and Figure 6. Indicating that the level of 100 kg N ha significantly higher by giving the highest average height of the tiller2 of 66.65 cm compared to the other levels 50, 150 and 200 mg N ha, which gave an average of this capacity was 58.16, 62.05 and 57.83 cm sequentially And a decrease of 12.73, 6.90 and 13.23%.

The treatment was 100 kg seed yield with 150 kg N fertilizer by giving the highest mean of 71.62 cm with an increase of 31.61% compared to the treatment 120 mg seed with 50 kg N fertilizer which gave the lowest average for this capacity 48.98 cm. (6) Indicates a positive relationship of positive correlation with several characteristics, including the height of the plant of the tiller3 and the thickness of the tiller1 and the tiller2, the length of the spike for the third branch, the number of the tillers of the tiller 3, the number of saplings of the first and second, and the number of grains of the tiller2, (r=0.641,r= 0.336, r=0.474, r=0.684, r=0.525, r=0.480,r= 0.447 and r=0.488) respectively.

Tiller there : (T3)

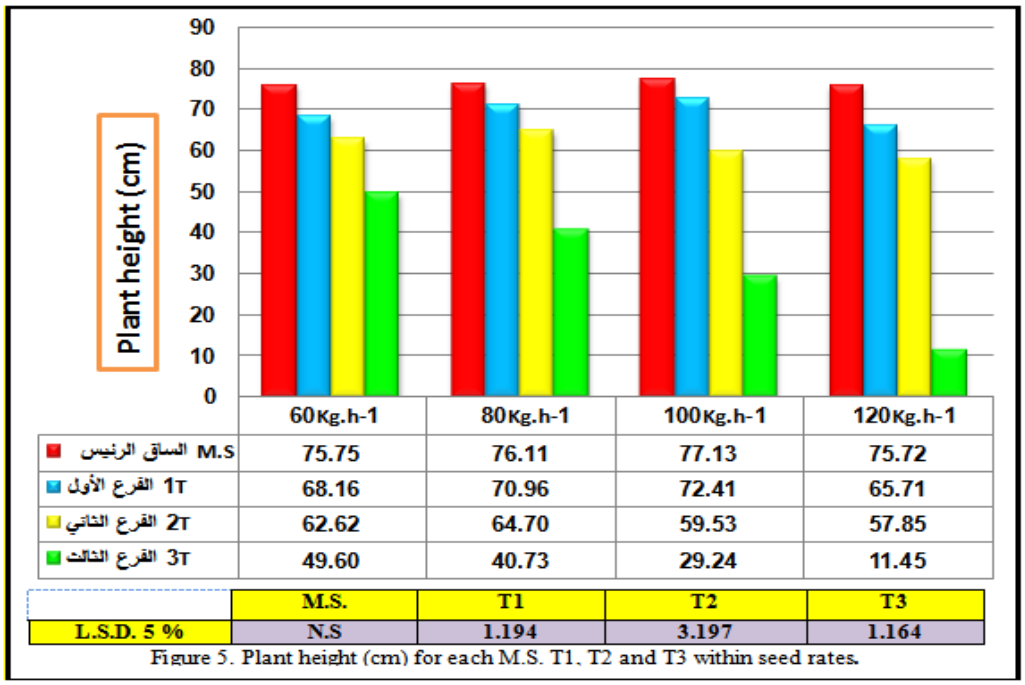
Table (5) and Figure (5): The increase in seed rates led to a decrease in the height of the tiller3, with an average of over 60 kg. Ha by giving the highest average height of the tiller3 amounted to 49.60 cm and by. An increase of 17.88 and 41.04. And 76.91% compared to the rest of the rates 80, 100 and 120 kg. Ha respectively, giving an average of 40.73, 29.24 and 11.45 cm respectively. This may be due to the fact that at low seed rates, the plant density is low, allowing the third branch to intercept as much light as possible and longer, unlike higher seed rates. In which there is intense competition between the plants on the one hand and between the main stem and the rest of the tillers in one plant on the other, which leads to the inability of the plant to plant or the death of branches early because of the lack of nutrients.The introduction of nitrogen levels, Table (5) and Figure (6) show that the level of 100 kg N ha is significantly higher than the average height of the third branch 41.23 cm. While the level gave 200 kg N ha, which gave a mean of 28.80 cm.

As for the overlap between seed rates and nitrogen levels, it is noticed that the treatment of 60 kg seed with 50 kg N ha was significantly higher by giving the highest average height of the third branch was 69. 35 cm in comparison to the treatments 100 kg seed with 200 kg N fertilizer and 120 kg seed with 50 kg N fertilizer and 120 kg seeds with 150 kg N fertilizer that notice any growth of the tiller 3 (abortion section). (6) Shows a positive relationship of positive correlation of this attribute with several characteristics, with the highest correlation value with the length of the tiller3 spike (r=0.899).

In the light of the above, it is observed that the level of 100 kg N ha is distributed at the other levels by giving the highest mean of MS and the t1, t2 and t3. This may be due to the role played by nitrogen and its contribution to the majority of the basic cell components. ZGS: 31-32, while its contribution to plant height increases after plant transfer to reproduction and transfer of substances represented to grains (major estuaries). This may be due to the role that nitrogen plays indirectly in the interaction of the biological reactions that occur in the metastatic regions, where the cellular division occurs and the need for the presence of oxyntic, and it is necessary in the construction of the amino acid tryptophan, which forms the basis for the construction of oxen **(Warening, 1893).**The response of the main stem and tillers to high nitrogen levels was not observed.

Table 5. Effect of seed rates and nitrogen levels on main stem height and tillers (cm)**.**

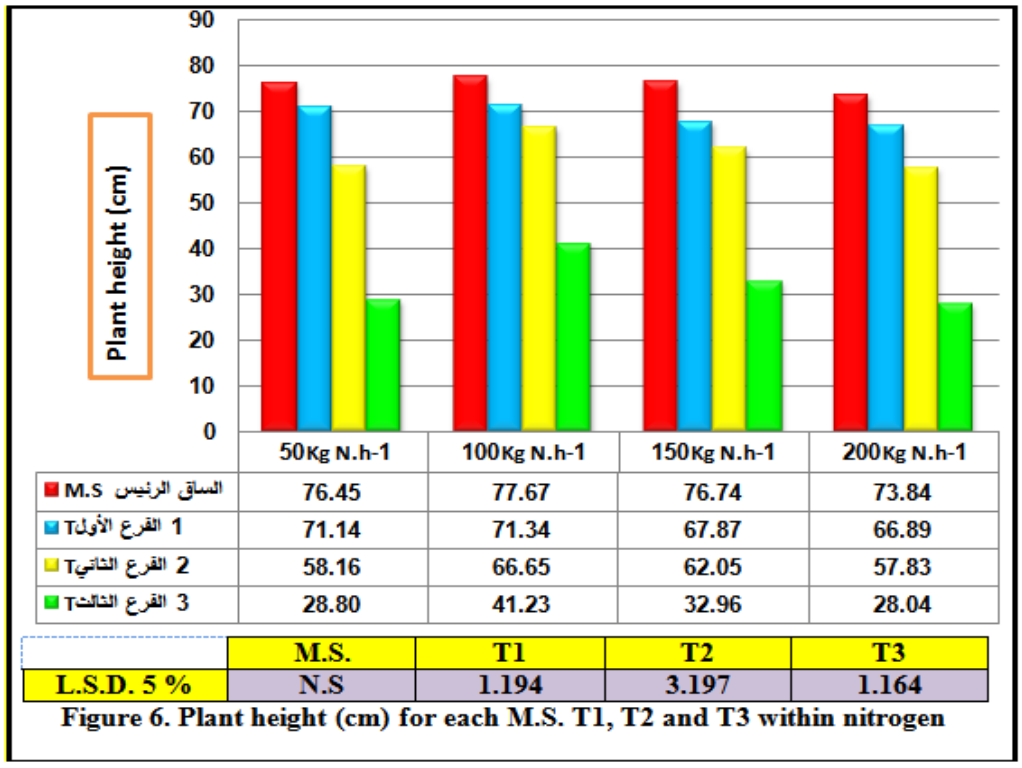
Mean	Levels of nitrogen (kg.ha)				Seed rates (kg.ha)	
	200	150	100	50		
75.75	74.61	75.79	75.02	77.57	60	Main Stem (M.S.)
76.11	70.51	78.61	80.80	74.50	80	
77.13	75.52	71.12	79.96	81.91	100	
75.72	74.70	81.43	74.90	71.84	120	
N.S	2.366				%5.l.s.d	
	73.84	76.74	77.67	76.45	mean	
	1.183				%5.l.s.d	
68.16	69.31	62.74	72.95	67.63	60	Tiller one (T1)
70.96	69.67	68.59	70.45	75.14	80	
72.41	74.80	73.98	68.91	71.95	100	
65.71	53.77	66.17	73.05	69.84	120	
1.194	2.389				%5.l.s.d	
	66.89	67.87	71.34	71.14	mean	
	1.194				%5.l.s.d	
62.62	53.23	64.67	61.58	70.98	60	Tiller two (T2)
64.70	66.39	61.33	71.46	59.62	80	
59.53	51.33	71.62	62.12	53.04	100	
57.85	60.38	50.58	71.45	48.98	120	
3.197	6.393				%5.l.s.d	
	57.83	62.05	66.65	58.16	mean	
	3.197				%5.l.s.d	
49.60	47.02	40.55	50.50	60.35	60	Tiller three (T3)
40.73	41.87	43.36	56.69	21.00	80	
29.24	0.00	47.93	35.20	33.84	100	
11.45	23.28	0.00	22.53	0.00	120	
1.164	2.327				%5.l.s.d	
	28.04	32.96	41.23	28.80	mean	
	1.164				%5.l.s.d	



	60Kg.h-1	80Kg.h-1	100Kg.h-1	120Kg.h-1
M.S الساق الرئيس	75.75	76.11	77.13	75.72
1T القرع الأول	68.16	70.96	72.41	65.71
2T القرع الثاني	62.62	64.70	59.53	57.85
3T القرع الثالث	49.60	40.73	29.24	11.45

	M.S.	T1	T2	T3
L.S.D. 5 %	N.S	1.194	3.197	1.164

Figure 5. Plant height (cm) for each M.S. T1, T2 and T3 within seed rates.



	50Kg N.h-1	100Kg N.h-1	150Kg N.h-1	200Kg N.h-1
M.S الساق الرئيس	76.45	77.67	76.74	73.84
1 القرع الأولT	71.14	71.34	67.87	66.89
2 القرع الثانيT	58.16	66.65	62.05	57.83
3 القرع الثالثT	28.80	41.23	32.96	28.04

	M.S.	T1	T2	T3
L.S.D. 5 %	N.S	1.194	3.197	1.164

Figure 6. Plant height (cm) for each M.S. T1, T2 and T3 within nitrogen

References

a. Ahmed, M. R. 2005. Responsive and Tolerance for some Varieties of Wheat toDifferent Rates of Herbicide Spraying Shiva Lear. M.Sc. Thesis. Coll. Of Agric.Baghdad Univ. Pp: 147.

[2]. Al-Hassan, M. F. H. 2011. Understanding the mechanism of branching in several varieties of baking wheat (Triticum aestivum L) with the effect of the rate of sowing and nitrogen level and its relationship to the recipient of grain and its components. PhD thesis. Faculty of Agriculture. Baghdad University.

[3]. Ali, Hakoomat, S. A., H. A. and F. S. Hassan. 2005. Impact of nitrogen application on growth and productivity of wheat (Triticum aestivum L.). J. Agri. Soc. Sci., 1(3): 216-218.

[4]. Ali, N. A. S. 2007. Introduction to soil fertility and fertilizer management. Ministry of Higher Education and Scientific Research. college of Agriculture. Baghdad University.

[5]. Almeida, M.L.D., L. Sangoi, Jr., A.M., A.C Alves, I.C. Nava, and A.C. Knopp, 2004. Tiller emission and dry mass accumulation of wheat cultivars under stress. Sci. Agri. (Piracicaba, Braz.). 61(3):266-270.

[6]. Behera, U.K., B.A. Chougule, R.S. Thakur, K.N. Ruwali, R.C. Bhawsar and H.N. Pandey, 2000. Influence of planting dates and nitrogen levels on yield and quality of durum wheat (Triticum durum). Indian J. Agric. Sci., 70: 434-436.

[7]. El-Baz, Mahmoud, Mohamed El Nagy, WafaaAmer, Mohamed Hani Mubasher and Hani Abdel-Zaher. The basics of general botany. Arab House Library. The Egyptian Arabic Republic.

[8]. Evers , J.B., J. Vos , C. Fournier , B. Andrieu , M. Chelle , P.C. Struik .2004. A3D approach for modelingtillering in wheat (Triticum aestivum L.) . 4thnternational workshop on functional structural acterization of vegetative development in small cereal grains. Agron. J. 74~789-792.

[9]. Falconer, K.R. and D.L. Sharma. 2006. High wheat seeding rates and plant density do not go hand in hand. 13th Australian Agronomy Conference: 10-14.plant models , 7 // June – Montpellier , France , P. 210-215.

[10]. Gracia del Moral, L.F., Y. Rharrabti., S. Elhani., V. Martos and C. Royo. 2005. Yield formation in Mediterranean durum wheats under two contrasting water regimes based on path-coefficient analysis. Euphytica. 146:213–222.

[11]. Gulnaz, S., M. Sajjad, I. Khaliq, A.S. Khan and S.H. Khan. 2011. Relationship among coleoptile length, plant height and tillering capacity for developing improved wheat varieties. Int. J. Agric & Biol. 13(1):130-133.

[12]. Hucl , P. and R.J. Baker . 1990. Effect of seeding depth and temperature on tillering characteristics of four spring wheat cultivars . Can. J. Plant Sci. 70 : 409-417.

[13]. Hucl , P. and R.J. Baker. 1989. Tiller phenology and yield of spring wheat in a semiarid environment. Crop Sci. Vol. 29.No. 3, p. 631-635.

[14]. Iqbal, N., N. Akbar, M. Ali, M. Sattar and L. Ali. 2010. Effect of seed rate and row spacing on yield components of wheat (Triticum aestivum L.). J. Agric. 48. (2): 151-156.

[15]. Islam S, Malik AI, Islam AKMR, Colmer TD (2007) Salt tolerance ina Hordeum marinum-Triticum aestivum amphiploid, and itsparents. J Exp Bot 58:1219–1229.

[16]. Jaddoa K. A. , A. Hu. AL-Maeini ,and R. A. AL-Zobiady .2017. Effect of Gibberellin and Ethephon on Growth and Yield of Bread Wheat Grown in Different Sowing Dates. International Journal of Applied Agricultural Sciences 2017; 3(5): 136-142.

[17]. Jaddoa, K. A. 1995. Wheat Facts and Guidelines. Publications of the Ministry of Agriculture. General Authority for Agricultural Cooperation and Extension.

[18]. Jaddoa, K. A., 2015. Crop Physiology and Productivity: The Iraqi Experience. International Journal of Applied Agricultural Sciences. 1(3): 74-78.

[19]. Kalid, M.S., M.F. Saleem, S. Ali, M.W. Pervez, M. Rehman, S. Hussain and K.Rehman. 2014. Optimization of Nitrogen Fertilizer level for newly evolved wheat (Triticum aestivum) cultivars. App.Sci. Report. 7(2): 83-87.

[20]. Klepper, B., Rickman, R.W. and Belford, R.K., 1983. Leaf and tiller identification on wheat plants. Crop Sci., 23: 1002-1004.

[21]. Klepper, B., Rickman, R.W. and Peterson, C.M., 1982. Quantitative characterization of vegetative development in small cereal grains. Agron. J., 74: 789-792.

[22]. Lafarge , T.A., and G.L. Hammer.2002. Tillering in sorghum over a wide range of population densities :modeling dynamics of tiller fertility .Annals botany (90): 99-110.

[23]. Lerner, S.E. and Satorre, E.H. 1990. Aplication de un disenoexpermintalsistematico al studio de la respuesta a la densidad de cultivares de trigo. Actas II Congreso Nacional de Trigo (Pergamino, Argentina) 1:44-50.

[24]. Naveed, K., M.A. Khan, M.S. Baloch, K. Ali, M.A. Nadim, E.A. Khan, S. Shah, and M. Arif. 2014. Effect of different seeding rates on yield attributes of Dual-Purpose wheat. Sarhad J. Agric. 30(1): 83-91.

[25]. Seleiman, M.F., M.E. Ibrahim, S.M. Abdel-Aal and G.A. Zahran, 2010. Effect of seeding rates on productivity, technological and rheological characteristics of bread wheat (Triticum aestivum L.). Int. J. Curr. Res., 4: 75-81.

[26]. Thiry, A.D., R.G. Sears, J.P. Shroyer and G.M. Paulsen. 2002a. Relationship between tillering and grain yield of Kansas wheat varieties. Kansas University-Agricultural Experiment Station and cooperative extension service, USA. http://oznet. Ksu. Edu.

[27]. Tilley, M., R. Heiniger, T. Smith and P.R. Weisz. 2010. Wheat tillers are a vital component for maximizing yield in wheat (Triticum aestivum L.). North Carolina State University, Raleigh, NC. USA.

[28]. Valerio, I.P., F.I. Carvalho, A.C. Oliveira, G. Benin, V.Q. Souza, A.A. Machado, I. Bertan, C.C. Busato, G.D. Silveira and D.A. Fonseca. 2009. Seeding density in wheat genotypes as a function of tillering potential. Sci. Agric. (Piracicaba, Brazil). 66 (1): 28-39.

[29]. Wareing, P.F. 1983. Interactions between nitrogen and growth regulators in the control of plant development. British plant growth regulator Group, Monograph. 9:1-4.

[30]. Wen-ming, Y., Y. Zhen-wen and W. Shou-jiang. 2006. Effects of nitrogen rate and seeding number on dry matter accumulation, grain yield and nitrogen use efficiency of wheat.Shandong Agric.Sci. 4: 35-37.

[31]. Zadoks, J.C. , T. T.T. Change , and C.F. Knozak . 1974. A decimal code for growth stages of cereals. Weed Res., 14 : 415-421.

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