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Study Yield And Yield Components Comparison Correlation Some Physiological Characteristics, 20 Genotypes Of Bread Wheat

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ABSTRACT

*In order to study the yield and yield components comparison correlation some physiological characteristics, 20 genotypes of bread wheat cultivars by modifying the old, and promising new lines selection and in a randomized complete block design (RCBD) with three replications in a farm field in Karaj Seed and Plant Improvement Research Institute from 1999 - 2000 was performed.data using statistical software (SAS) analysis of variance genotype and compared using duncan's multiple range test at 5% level was and simple correlation coefficients different characteristics of and its components to determine and then by linear regression and the stepwise between traits with grain yield were determined. Analysis of variance showed Figures of the traits seed yield , grain filling rate in the main spike, grain weight, harvest index, Plant grain weight, hectolitre index, the main stem spike length, flag leaf area, peduncle length and main stem, plant height, grain weight per spike main stem, main stem length, number of grains per spike in the likelihood of a significant percentage Yield of straw, and plant biomass at the five percent significance level The number of spike per unit area yield and protein content did not show significant differences. All number of genotypes with maximum yield of 8217 kg / hectare Up to 42% and harvest index Tajan and number with a minimum yield was 5348 kg/hectare. The highest correlation with the per hectare yield of grain filling period in the 1% level significant And positive (r = 0 . 83 **) was a negative correlation between the number of grains per spike and grain weight and significantly at the 1% level (r =- 0 . 64 **) respectively. The number of spikes per unit area , The number of grains per spike and grain weight of non-financial performance and significant positive correlation. This implies that the increased. function of grain per hectare, but these three are related and by stepwise regression on the trait most hectare, The grain filling period.*

Key words: *Main stem, Bread wheat, Grain yield , Harvest Index.*

INTRODUCTION

Wheat farming and food products are important and significant role in ensuring people's food and agriculture Significant progress in increasing wheat production to a new power has emerged.This progress is due to the use of advanced technology. Still, more progress is conceivable The easy operation of the facilities provided in radiation research. Thus knowledge of the velocity and the grain filling period can be important in selecting varieties for

different regions. Pollen grain filling to physiological maturity interval of seeds or grain growth have been defined [12].

Grain yield in wheat is the final product produced that come in on a series of consecutive reactions occur. In other words, grain yield depends on the balance between accumulation and its distribution between the source and the reservoir is And may be limited by both[7].

Yield components in wheat spike number per unit area (density spike), the number of grains per spike and grain weight is average [1, 15].

When the number of grains per spike, grain weight per spike generally be low rise [2]. In other words, the maximum performance that can be produced in a given environment the ceiling. It can not be exceeded so that the seed will increase the weight [10].

Generally, the components are not independent of each other and a component may be reduced in one of the other components. In other words, increasing the number of plants per unit area of land, number of spikes per plant is reduced Increasing the number of grains per spike and grain weight is reduced. This means that all components function properly in a good balance of performance should be compared with each other [19].The physiological basis for further understanding and better knowledge of product performance, yield components in the plant community is important to you. In a two-year study of the correlation between grain yield And number of grains per spike of wheat genotype 30 positive and significant at 1% level (r=0.66**) was reported[13].

A plant can yield through increased dry matter production at the farm or increase the economic contribution (harvest index), or both high-range [13].

Wallace et al expressedindex found that 32% of the wheat varieties were planted in early 1900To 49% in about half a foot shorter and the current product varieties has increased[22].

Some studies have shown Flags on plant performance is the size of the lamina level. Regarding this case, Check for these traits in 25 genotypes of wheat and the result is a significant positive correlation was found between flag leaf area and yield components [15].

In a two-year study with 30 genotypes of wheat flag leaf of the relationship between grain yield was achieved [13].

Also a review Gorgan in terms of correlation between yield and with 14 digits in length, width and flag level review And the relationship between these traits and performance was achieved [14].

During a study of 11 traits in 42 wheat cultivars under rainfed conditions were native that the plant height and peduncle length had a negative relationship with performance [17]. In a two-year study of 30 wheat genotypes correlated with plant height (r=0.72) showed positive and significant[13].

Brooking and Kirby Between the stem and spike length positive and significant correlation (r=0.45) reported [3].

During a study on the biological performance of 14 wheat cultivars and a significant positive correlation with performance at 1% (r=0.46**) demonstrated [14].

Cook and Evans (1978) Correlation between the number of fertile tillers were negative with the grain [4].

A 2-year review Another link between yeild and number of grains per spike in wheat genotypes in 30 positive and significant at 1% (r=0.66**) Was reported[13].

Knowledge of the velocity and the grain filling period can be important in selecting varieties for different regions. Pollen grain filling to physiological maturity interval of seeds or grain growth have been defined [12].Gebeyehou et al (1982) and other sources during the grain filling period are reported on an effective yield.

But Bruckner and Frohberg and some other sources of grain filling and grain yield during grain filling have been reported to be effective[2 , 21].

Importance And Necessity Of Research

Determine the relationships between different traits in bread wheat genotypes

MATERIALS AND METHODS

This test crop year 1999-2000 Seed and Plant Improvement Research Institute in the field of Karaj With 35 degrees and 48 minutes north latitude and 51 degrees 10 minutes east longitude and latitudae and altitude of 1321 meters above sea level and has a clay loam soils was conducted at 45 km West of Tehran. With climate (Figure 1), average minimum, average, maximum and average temperatures and (Figure 2) Medium Relative humidity and rainfall in crop testing indictes the location of 1999-2000 in the city of Karaj. In order to assess the performance of this test comparison of yield components and physiological correlation of some properties, 20 genotypes of bread wheat through improved cultivars of old, new and promising lines selected Randomized complete block design with three replications in a field modification and Plant Research Institute, Karaj seed crop year 1999-2000 was conducted and agronomic traits in the seed yield, grain filling rate in the main spike, grain weight, harvest index, grain weight per plant, hectoliter index, main stem spike length, flag leaf area, peduncle length of main stem, plant height, weight grains per main stem, main stem length, number of grains per spike, straw yield and plant biomass, number of spikes per unit area was measured during the season. Season length was measured Kjeldahl method and protein content after harvesting food by expert laboratory measurements And Was King. Data using statistical software (SAS) analysis of variance and comparison of genotypes using the Duncan test at 5% level was And simple correlation coefficients between various traits and yield components were determined And then by stepwise linear regression and correlation between traits with grain yield were determined.

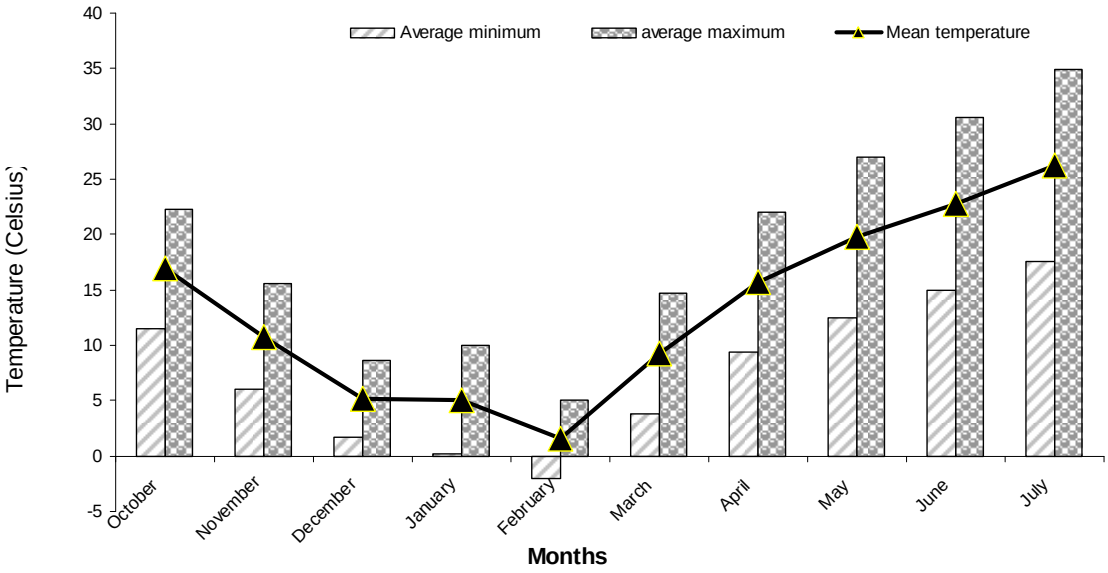

Figure 1 - The minimum, maximum and average temperatures in different months of the crop year in 1999-2000 Karaj

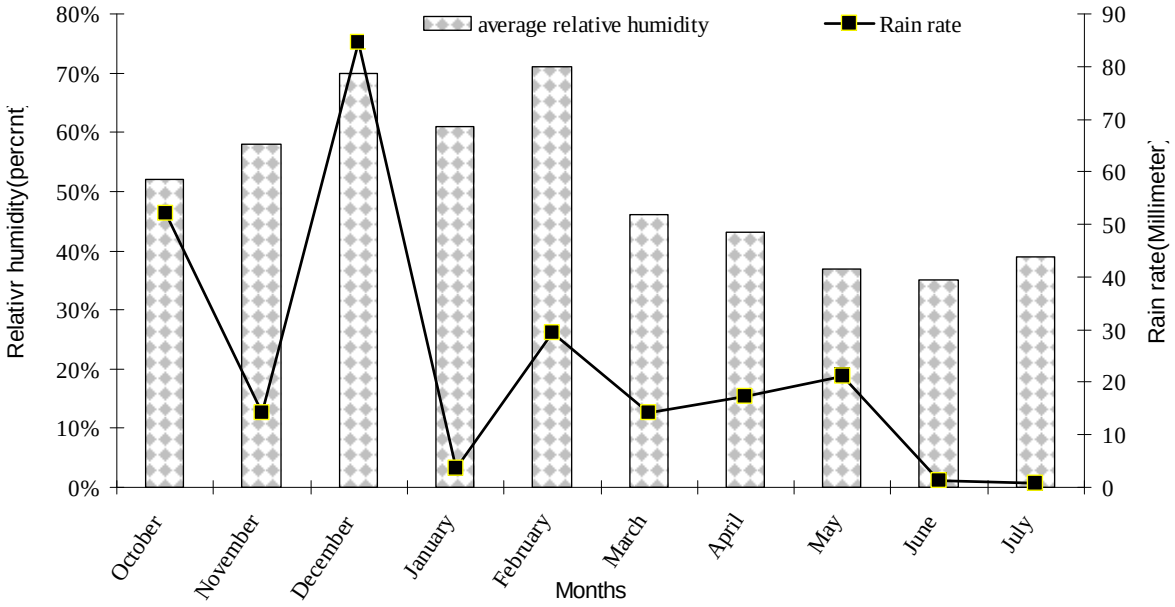

Figure 2 - The average relative humidity and rainfall in the months of the crop year in 1999-2000 Karaj

RESULTS AND DISCUSSION

The results of analysis of variance showed The figures in terms of grain yield per hectare, grain filling rate in the main spike, grain weight, harvest index, grain weight per plant, hectoliter index, main stem spike length, flag leaf area, peduncle length of main stem, plant height, weight The main stem spike grain, Along the main stem , The number of grains per spike Significant at 1% probability level, Straw yield, plant and Biomass in the 5% level of significance But the number of traits Number of spikes per unit area Protein did not show significant differences(Table1).

Comparison of grain yield per hectare, number of grains per spike, grain filling rate in the main spike, grain weight, ear number per unit area, biomass, harvest index, grain weight per plant, hectoliter index, spike length, main stem, leaf flag, in table(2) are shown. among the varieties of Ghods with the production of maximum yield per hectare and 8217 kg/ha Chamran cultivars producing at least 5920 kg/ha grain yield per hectare, Falat generating 46 grains per spike maximum number of grains per spike and number of Golden with the production number 30/6 grains per spike, the minimum number of grains per spike, number of gold production 4.2 (mg of growing degree days) maximum grain filling rate spike main stem and the Zagros produces 1.79 (mg of growing degree days) at the grain filling rate spike main stem, the light producing 54/73 (g) maximum seed weight and number Atrac producing 37.06 (g) the minimum weight grain, the figures regarding the number of spikes per unit area observed difference.

But the production Marvdasht 438 (spikes per square meter) maximum number of spikes and Marvdasht with 326 (Spike in square meters) with minimal production spike, Helmand with the weight of 6.97 (g per plant) with a maximum biomass production and Chamran cultivars produced 64.01 (g per plant), the minimum biomass production, harvest index up 42% of production per hectare and Figure Hirmand producing 32% minimum harvest index per hectare, the plateau production weight 2/49 (g per plant), the maximum seed weight and figure C-73-6 production 1.42 (g per plant) at least seed weight , the plateau production weighted 10.98 (g per plant), the maximum spike length of main stem and the Atrac with the production of 8.51 (cm), spike length of main stem, the Hirmand with flag leaf area 22.5 (cm) maximum spike length of main stem and the figure with the Atrac production 8.51 (Cm) along the main stem spike, the results suggest that Wheat varieties that are suitable for high production capacity compared to other cereals and the management of their culture, especially in terms of planting date, plant density and fertilizer needs to be studied (Table 2).

Yield Grain weight per main stem, The main stem spike length, Period of grain filling and seed weight Have a significant positive correlation (Figure 3).

Correlation between grain yield and grain filling period (r = 0.83 **) than the correlation between grain yield and

grain weight per main stem (r = 0.62 **), respectively, of the equations (Y = 515.70 + 0.05628X) and (Y = 0.93 + 0.001X) will follow.

This means that although increasing the yield of grain filling period (Table 1) Dry matter (biomass) is also increased But this increase in yield of dry matter has increased far more than But positive correlation with harvest index and grain yield was significant (Table 4).

Hashemi Dezfuli et al (1996) and Siadat et al (1999)The most important yield In determining grain yield, harvest index, compared with Compared with the dry matter have been emphasized in Triticale With inconsistent findings This is because One of the differences between genotypes and species and environmental conditions can be proposed.

Overall performance is the product of three components, namely the number of spikes per unit area (Y = 304.92 + 0.0129X and r = 0.33^{ns}), number of grains per spike (Y = 26.15 + 0.002X and r = 0.32ns) and seed weightWeight Thousand Grain (Y = 37.06 + 0.001X r = 0.22^{ns}) is. Other sources also stressed that only has three[1].\According to the above except the number of fertile tillers per square meter or per unit area is a major component of performance. This component of the functional performance of the emergence, tillering ability, tiller survival, genotype and environmental conditions are.

Although different genotypes of wheat production to deal with their differences density than conventional crops, but this feature will change [10].

The reason for this spike in the density per unit area showed no significant difference between genotypes So that changes in performance related to this component. Number of grains per spike and grains per spike zone showed a significant difference at 1% level. It can be concluded The high yield in wheat genotypes studie Top of seed weight and seed number per ear was more For example, these two traits in the two varieties can be Alvand and The first is that the latter has a high seed weight and seed number per spike is more Considered. Tajan, due to the low number of grains per spike and grain yield was low down. While M-75-10 genotypes in terms of the number of grains per spike with Tajan was in a group. But the grain of seed weight was Tajan. The result was a higher performance. It can be concluded I do not act independently of the functional components But except when an increase or decrease Other components may increase or decrease. In other words, the components of a compensation act. Negative correlation between seed weight and seed number per spike (r = -0.64 **) level and the likelihood of a significant negative It argues that the Performance of the components are interdependent And confirmation of the above (Table 3). Be low when the number of grains per spike Seed weight increases. Optimal performance is achieved when Yield components relative to each other that are in equilibrium.

The number of spikes per unit area, number of grains per spike and grain weight, but non-significant positive correlation with performance. This implies that the performance increase of grain per hectare, but these three are related. Although these three components in this relationship was not significant with the performance of grain per hectare, But Pyrvznya et al (1999) between the number of grains per spike and grain yield significant positive correlation at 1% level reported.

Finally, by stepwise regression (stepwise selection) traits associated with grain yield was determined traits that the most important trait grain filling period were identified as the main trait affect. It can be proposed the figures used in the future if conditions are with a long grain filling period are and or if it is modified for performance pay special attention to these traits.

Summary results

The most important trait grain filling period were identified as the main influence that trait should be paying particular attention to this trait.

Post
Hereby therefore all those who in any way in this research were my friend thanks Be.

Table 1 - Analysis of variance of quantitative traits in 20 genotypes of bread wheat

S.O.V	df	Mean of Squares								
		Grain weight plant	Harvest Index	Biomass	Num spike area	1000 seed weight	Grain Growht Rate Main Stem	Grain yield	Hacolitter Index	Main spike length
block	2	0.154ns	0.0003**ns**	0.832**ns**	1144.1**ns**	0.056**ns**	0.00001**ns**	35.4986**ns**	3.313**ns**	0.340**ns**
Genotypes	19	0.300**.	0.0023**	0.136*	3865.1ns	5.522**	0.00124**	234879.92**	7.394**	1.939**
Error	38	0.116	0.00054	0.994	7221.5	1.383	0.0004	793350.81	0.501	6.63
%C.V		16.75	6.21	18.33	21.54	2.67	6.72	12.61	0.87	4.69

ns,* and**:Non Significant, Significant At 5% And 1% Levels Respectively

Continued

Table 1 - Quantitative traits studied in 20 bread wheat genotypes

S.O.V	df	Mean of Squares							
		Main stem length	Grian weight spike main stem	Protein percentage	plant height	Padancal length main stem	Falg leaf area	Num seed spike	Straw yield plant
block	2	89.175*	0.012**ns**	0.345**ns**	149.485**	2.557**ns**	12.171**ns**	5.440**ns**	0.2881**ns**
Genotypes	19	259.885**	0.092**	0.526**ns**	360.528**	67.697**	19.152**	67.909**	1.085*
Error	38	21.388	0.020	0.496	0.187	2.090	5.773	13.485	0.483
%C.V		4.69	8.02	6.26	5.04	3.96	13.12	9.64	20.43

ns,* and**:Non Significant, Significant At 5% And 1% Levels Respectively

Table 2 - Comparison of quantitative traits in 20 genotypes of bread wheat.

Recipes Genotypes	Grain yield	Num seed spike	Grain Growht Rate Main Stem	1000 seed weight	Num spike area	Biomass	Harvest Index	Grain weight plant	Hacolitter Index	Main spike length	Falg leaf area
	(Tan/ha)		(mgr/GDD)	(gr)	(m)2	(gr)		(gr)		(cm)	(cm)2
Ghods	8217a	43.6abc	3.68bc	42.13def	400a	5.33abcd	0.42a	2.23abcd	80.36d	10.4ab	19.4abcdef
Falat	6813abcd	46a	3.28bcd	42.13def	407a	6.03abc	0.41ab	2.49a	80.86cd	9.12def	21abc
Tajan	5348d	36.7cdefgh	3.35bcd	42.13def	366a	4.68bcd	0.36defgh	1.67defg	78.05e	9.21def	15fg
Marvdasht	7799ab	42.3abcd	3.03cde	40f	438a	5abcd	0.39abcd	1.98abcdefg	80.96cd	9.04defg	15.6fg
Nicknejad	5795cd	39.1abcdef	2.72fg	40.4ef	382a	5.31abcd	0.33gh	1.81bcdefg	80.53d	9.24def	18.1bcdefg
Chamran	5920cd	35.1efgh	2.23gh	42.93d	374a	4.01d	0.39abcde	1.59efg	80.9cd	8.26gh	14.1g
Darab-2	7700ab	37.8bcdefg	2.67fg	43.46d	430a	5.37abcd	0.38abcdef	2.07abcdefg	82.9ab	9.36cde	18.4bcdefg
Atrak	6276bcd	44.1ab	2.47fg	37.06g	357a	5.53abcd	0.39abcd	2.19abcdef	82.96ab	8.51fgh	17.7cdefg
S-75-20	5675cd	31.1gh	2.24gh	42.46de	374a	4.2cd	0.37bcdefgh	1.54fg	83.36ab	7.76h	16.2defg
Zagros	6320bcd	30.6h	1.79i	46.93c	414a	6.55ab	0.37bcdefgh	2.42ab	80.35d	9defg	20.4abcdef
Hirmand	6936abcd	36.3defgh	2.69fg	47.46c	368a	6.97a	0.32h	2.28abcd	83.26ab	9.17cde	22.5ab
C-73-5	6053bcd	37.6bcdefgh	3.64bc	40.53ef	388a	4.22cd	0.33gh	1.42g	79.86d	8.43fgh	15.8efg
Alvand	8127a	39.6abcde	3.97ab	47.2c	367a	5.79abcd	0.39abcde	2.24abcde	83.83a	10.14bc	18bcdefg
Mahdavi	7211abc	32.2fgh	3.46bcd	50b	326a	5.87abcd	0.34fgh	1.98abcdefg	79.01d	8.76defg	19.6abcdef
Zarrin	7733ab	42.9abcd	4.2a	42.4de	356a	6.91a	0.35efgh	2.39abc	79.86d	10.5ab	18.1bcdefg
M-75-7	8144a	32.2fgh	2.6fg	50.8b	432a	5.12abcd	0.41abc	2.09abcdef	83.23ab	8.82defg	16.1efg
Kavir	7188abc	39.9abcde	2.45fgh	43.13d	470a	5.96abcd	0.37bcdefg	2.22abcde	79.7d	9.58cd	23.8a
M-75-10	7231abc	43.8abc	3.4bcd	42.53de	432a	6.03abc	0.38abcdefg	2.3abcd	82.33b	10.98a	18.2bcdefg
Roshan	6288bcd	32.4fgh	3.03cde	53.73a	384a	5.04abcd	0.34fgh	1.73cdefg	82.23b	9.54cd	20.9abcdef
C-73-20	7010abcd	37.6bcdefgh	2.97d	42.13def	416a	4.81bcd	0.38abcdef	1.97abcdefg	80.43d	8.56efg	16.9cdefg

Means followed by similar letters in each column are not significantly different at 5% probability level.

Table 3: The correlation of quantitative traits in 20 genotypes of bread wheat

Recipes	Falg leaf length	Grain Growht Rate Main Stem	Num seed spike	Grian weight spike main stem	1000 seed weight	Num spike area	Grain yield	Biomass	Harvest Index	Grain weight plant	Straw yield plant	Protein percentage	Main stem length	Main spike length	Hacolitter Index	Padancal length main stem	plant height	Anthesis Physiological Maturity
Falg leaf length	1.00																	
Grain Growht Rate Main Stem	-0.31	1.00																
Num seed spike	-0.10	0.47*	1.00															
Grian weight spike main stem	0.01	0.62**	0.57**	1.00														
1000 seed weight	0.28	-0.02	-0.64**	-0.05	1.00													
Num spike area	0.16	-0.30	0.18	-0.12	-0.10	1.00												
Grain yield	-0.01	0.41	0.32	0.62**	0.22	0.33	1.00											
Biomass	0.56**	0.16	0.26	0.54	0.21	-0.01	0.41	1.00										
Harvest Index	-0.16	-0.04	0.38	0.29	-0.22	0.40	0.44	-0.15	1.00									
Grain weight plant	0.47*	0.12	0.46	0.62**	0.06	0.24	0.60**	0.87**	0.35	1.00								
Straw yield plant	0.55*	0.16	0.12	0.44	0.26	-0.14	0.26	0.96**	-0.40	0.70**	1.00							
Protein percentage	0.25	-0.03	-0.19	0.19	0.43	-0.19	0.16	0.20	0.20	0.24	0.15	1.00						
Main stem length	0.29	0.35	-0.19	0.20	0.62**	-0.14	0.19	0.23	-0.40	0.02	0.31	0.01	1.00					
Main spike length	0.18	0.59**	0.52**	0.61**	0.09	0.18	0.55*	0.56**	0.11	0.57**	0.49*	0.03	0.37	1.00				
Hacolitter Index	0.02	-0.23	-0.06	-0.05	0.21	0.07	0.26	0.05	0.20	0.15	0.00	0.03	-0.03	-0.02	1.00			
Padancal length main stem	0.46*	0.09	-0.32	-0.10	0.55*	0.08	0.00	0.11	-0.47*	-0.11	0.22	-0.19	0.83**	0.29	0.02	1.00		
plant height	0.35	0.43	-0.04	0.31	0.51*	-0.09	0.31	0.24	-0.20	0.12	0.26	0.06	0.94**	0.52*	-0.06	0.79**	1.00	
Anthesis Physiological Maturity	0.13	0.48*	0.30	0.58**	0.38	0.13	0.83**	0.48*	0.26	0.56**	0.38	0.32	0.36	0.62**	0.12	0.19	0.46*	1.00

* and**: Significant At 5% And 1% Levels Respectively

Table 4: Linear regression equation, intercept, slope of the line and coefficient of variation in traits

Recipes	a	b	Linear regression equation	R2	Recipes	a	b	Linear regression equation	R2
Falg leaf area	14.07	0.00061	Y=14.07+ 0.006X	0.04	Biomass	2.75574	0.0003	Y=2.75+ 0.002X	0.16
Grain Growht Rate/Main Stem	1.01424	0.00028	Y=1.01+ 0.002X	0.16	Harvest Index	0.04621	0.0001	Y=0.04+ 0.001X	0.18
Num seed/spike	26.1594	0.00173	Y=26.15+ 0.002X	0.10	Grain eight/plant	0.58354	0.0002	Y=0.58+ 0.002X	0.35
Grian weight spike main stem	0.93426	0.00012	Y=0.93+ 0.001X	0.39	Straw yield/plant	2.20543	0.0001	Y=2.20+ 0.0002X	0.06
1000 seed weight	37.0640	0.00100	Y=37.06+ 0.001X	0.04	Protein percentage	10.69602	0.0001	Y=10.69+ 0.0001X	0.02
Num spike /area	304.928	0.01294	Y=304.92+ 0.0129X	0.10	Main_stem_length	73.28953	0.002	Y=73.28+ 0.0020X	0.29
Main spike length	5.83233	0.00049	Y=5.83+ 0.0005X	0.29	Hectoliter	78.00037	0.0004	Y=78.00+ 0.0005X	0.06
Peduncle length main stem	36.2985	0.00001	Y=36.29+ 0.0001X	0.03	plant height	68.58125	0.0042	Y=68.58+ 0.0042X	0.09

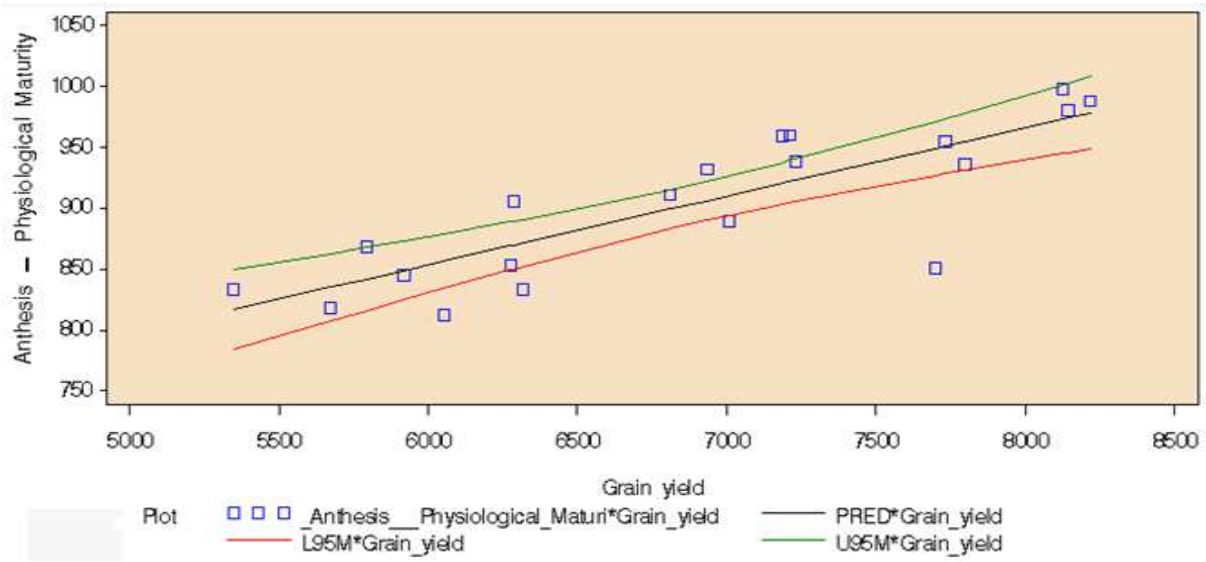

Figure 3 - Relationship between grain yield and grain filling period

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