

**THE EFFECT OF NITROGEN AND CHLOROPHYLL CONTENT OF DRY  
MATTER PRODUCTION THREE WHEAT CULTIVARS IN CLIMATIC  
CONDITIONS IN AHVAZ**

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**ABSTRACT**

Effect of chlorophyll on dry matter production of wheat (*triticum aestivum l.*) by chlorophyll meter (SPAD) in 2005 in agriculture farm of shahid chamran university was studied in factorial Experiment with a completely randomized blocked design with three replication and five levels of Nitrogen (0 , 25, 50, 75, 100 Percent ) for production 5 ton/ha wheat in addition three places of field References that applied all of Needed of Nitrogen for production of 5ton/ha grain Wheat. The first readings of chlorophyll by chlorophyll meter performed from the upset leaf in step 5 of. and after that two readings was performed and synchronizing with Readings Dry matter measuring. Differences between treatments and references was calculated the real Fertilizer to apply. The results showed a high correlation between chlorophyll production (SPAD reading ) and Dry matter Production. There was a significant differences between SPAD readings of treatments in three cultivar of wheat We can use SPAD for estimating of top-cover nitrogen.

**Keywords: Wheat, Nitrogen , Dry matter, chlorophyll, chlorophyll meter**

**INTRODUCTION**

The best way to produce more food, agricultural inputs to add a balanced increase the production per unit area (1). fertilizer and other inputs to increase According to documents in the agricultural production more effective (9,

10). Obviously, a balanced and appropriate food manufacturers add to their products to be able to deliver genetic data Plant (2, 3 and 5). Additional nitrogen to the production of wheat is susceptible to lodging and disease is to reduce production and increase costs. The potential productivity of nitrogen (No<sub>3</sub>) ground and surface waters with nitrogen fertilization increases (9). Lopez et al., In 2001 a study on the winter wheat. Tried to measure the concentration of nitrogen in the stems and leaves in the burst (open flowers), grain nitrogen content in the subject prior to maturity and therefore see the need Cody before flower opening up to obtain seed protein (13). Hussein and his colleagues reported in 2000 because of low nitrogen fertilizer is a problem in rice cultivation in Asia will reduce production, chlorophyll meter determines the rice to fertilizer when the road needs (11). Van den Berg Veprkynz their 2001 study of sweet maple leaves on the nitrogen content of chlorophyll meter to the conclusion that the chlorophyll meter is a device about the value for researchers (15).

#### **MATERIALS AND METHODS**

The field trial tested a number of Agronomy and Plant Breeding martyr Chamran University took place. The experimental farm in the southwest of the western border Ahvaz Karoon River

(Latitude 31 degrees 20 minutes north and 48 degrees east longitude length with a height of 20 meters above sea level) is located. The test consists of two wheat varieties Faktvrshaml figure 1. Fung (early) V1=2- Chamran (medium) = V2, 3- digit Star (late) = V3 and five levels of urea fertilizer from the bottom of zero Percent = N1, 25 percent = N2, 50 percent = N3, 75 percent and 100 percent = N4 = N5 fertilizer needed to produce 5 tons per hectare of wheat in triplicate In a factorial experiment based on randomized complete block design was 84 in season 85. The test piece was an area of 1500 square meters. Experimental plots soil before planting in the laboratory of Soil Schools were analyzed by conventional methods. The land in question was iron plow and then was hit hard and rivers to irrigate farm fields under cultivation furrower was built and after it all went atmosphere. Barley crop nutrients to the soil and uniform pieces of food and reduce food materials stored in the soil and react Different levels of urea in the experiment was carried out properly. On 2005 barley was harvested. The amount of 5/7 kg and 15 kg of potash fertilizer, phosphate fertilizer and 5.22 kg of urea fertilizer equivalent to half of the required piece of land was given to the pilot. After eating the disk, tests have been implemented. 3 replicates of each

experiment as a reference or the reference has been wheat, in 4 pieces, each with a length of 32 m. Width of 2 m was carried out between each iteration of a stream of water for irrigation has been created. In this way, the width of the ground 18 meters and its length was 32 meters. Repeat every 15 Crete 2 \*2 meters plot area of 4 square meters and a land plot with a length of 10 meters and width of reference or references Tuesday 2 meters with an area of 20 square meters was created. Fix the third phase (30 days after planting), nitrogen remaining in the field, but the rest of the plot referenced repeats three no nitrogen was added. Potash and phosphate fertilizers at a rate of 7.5 kg of potash fertilizer, phosphate fertilizer and 15 kg to the ground before planting but nitrogen is used as the basis of urea was 46%, half of which (22.5 kg /g) at the beginning of planting the entire field is on the base.

#### **Preparation of reference pieces**

Gene plant needed at all times be sufficiently supplied. The difference between the number SPAD reading this piece and the main piece of the formula, the lack of nitrogen in the main piece of the desired results. Since reference each independent of the other cultivars of wheat cultivars used in this experiment, three references were created. Fixed the reference for stage 3 To use the manure

from the bottom of the second from the bottom consumed 600 grams of fertilizer per 20 square meters per plot of wheat. Wheat began in 2005 on the Green. 4-3 leaf stage to thinning the field and plant density was 400 plants per square meter.

#### **Plot mainland**

In the 31-30 or 6-5 Zadvks fixed with reference piece and chlorophyll readings in all the plots and compare them with each other and also using the formula  $(D \times 7) + 6 = N$  nitrogen on per lb / a pound of Iker obtained. D the difference between the reading of each piece of data in reference to the same figure in the plots with fertilizer regime is clear. N nitrogen is needed for each plot is compared with a reference. The 6-5 fixed (the emergence of the first node) of chlorophyll by chlorophyll meter was read. The first reading was done on 2005 All plots of the plot 100%, 75% and 50% Fung and Chamran fertilizer and manure plots, 25% was applied to 2 days later when the Star 6-5 plots was not fixed to phase out 100% and 75%, fertilizer and other actions taken on the same day was postponed to 2 days. Readings from the center of Crete and from 10 am to 2 pm, respectively. Usually leaves (leaf) or leaves before the flag leaf was elected to do.

#### **RESULTS AND DISCUSSION**

Among the treatments most weight in the main stem of the N5 and N1 lowest,

because it would be an increase in leaf area, LAD maintaining and encouraging more leaves to increased photosynthesis. The amount of nitrogen is used. Among the figures in the late Astar shoot dry weight was lower in the early Fong. This difference was significant at 1%. The reason for this Phenology is different because of the differences in the figures. Because treatment N5, the plant had the highest amount of dry matter is that most N5 absorb nitrogen and produce more chlorophyll and therefore do more photosynthesis, the production of dry matter more than others treatment. With such a strong relationship between chlorophyll content and nitrogen concentration is positive for a performance, to understand the amount of nitrogen the plant through chlorophyll concentrations to predict the level of performance is important. Most of the early varieties Fong Star had the lowest height. Fong was used to shoot because earlier than other varieties began to increase its height. Chamran and Fong figures with a height of more than Star, have superior yield. Changes in the figures of dry matter.

The reference figures in the plot, there is a significant difference in dry matter production, which depends on the genetic roots of their ability to produce chlorophyll, efficient use of nitrogen and

phenology growth figures and so on. 60 After saying the figures showed a difference planting in the production of dry matter and at this stage the highest production and thereafter Fong Chamran was Lastly Astarqrar figure. Since the late star is enough time for evolution is so slow that in Second, this issue has continued sampling but results were obtained in samples taken last digit is obvious that the period Or delayed more than the higher dry matter production and lower production figure lower lifetime show. The Star of the late clay, so the higher end and the lower end of Fong which is premature at the end The period shown. As Fig. 1 through 4 show the production of dry matter in a way the cultivar Star eventually most Dry matter production. But it is too dry waste. Chamran a moderate amount of production. As a result, the dry matter accumulation Star Fong faster and slower and Chamran average. Star of late and early Fong This makes the star more production and less production Fong show, although statistically significant difference between the final production of Chamran and Fong found. The process of dry matter accumulation in the treatments As Figure 1, 2 and 3 show, in all treatments minimum dry matter accumulation in N1 and N5 is the highest, and this shows the strong correlation

between the amount of nitrogen and chlorophyll near its relationship with the production of dry. Also in the comparison between SPAD reading numbers by various plots and there the matter closely. N1 treatment has received the least amount of nitrogen, dry matter has been found in all but the lowest figures N5 highest material Shows that due to the largest fertilizer from the bottom, the more chlorophyll production and use of facilities such as light - temperature and food was efficiently As a result, the product also has shown more. This result corresponded with the results of studies Lviyd mardak et al in 1997 (12). Fong at all levels of the nitrogen used in the first and second sampling has been the highest values of dry matter, but as shown in Figure 4, the Star of the other figures surpass. At N1, N2, N3 and N4 in the first sample Fong The highest dry matter and thereafter Chamran and at the end of the Star and N5 seen this trend, but it is different from N1 to N5 production of dry growing. Due to the performance of N1 to N5 for optical receiver having photosynthetic chlorophyll production, increased leaf area, LAD and leaves in charge of photosynthesis is harder. But on stage Star surpass the harvest in all treatments depending on genetic factors is the Star. Star figure because the growing season is long, the roots continue to

absorb practice and could make better use of water and nitrogen. Most of the dry matter in N5 can be due to increasing nitrogen at flowering and maintain stability and durability due to more and more chlorophyll and photosynthesis LAD to assimilate when competition is there between the stem and seeds . Because increasing the dominance of reducing photosynthesis Competition. Given the positive correlation between the number read SPAD chlorophyll and nitrogen in leaves was observed rate, you can read the numbers used to determine the lack of nitrogen fertilizers in the shortest amount of good roads determined for wheat. Obviously, the numbers SPAD to type wheat is variable, for any number of wheat varieties should be determined. Among the treatments most weight in the main stem of the N5 and N1 lowest, because it would be an increase in leaf area, LAD maintaining and encouraging more leaves to increased photosynthesis The amount of nitrogen is used. Among the figures in the late Astarbyshttr shoot dry weight was lower in the early Fong This difference was significant at 1%. The reason for this Phenology is different because of the differences in the figures. Because treatment N5, the plant had the highest amount of dry matter is that most N5 absorb nitrogen and produce more chlorophyll and therefore do more

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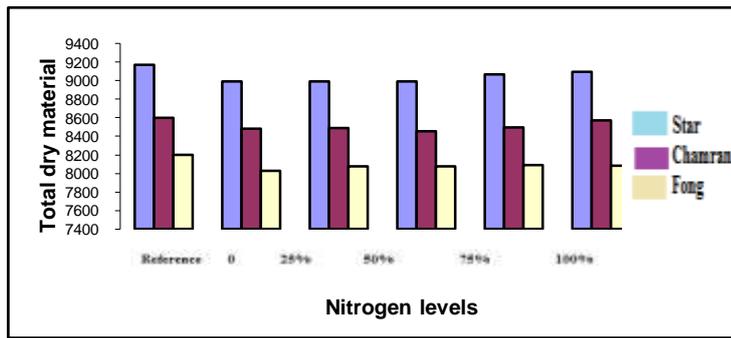


Figure 1: Comparison of the amount of dry matter produced in the first sampling (60 days after planting)

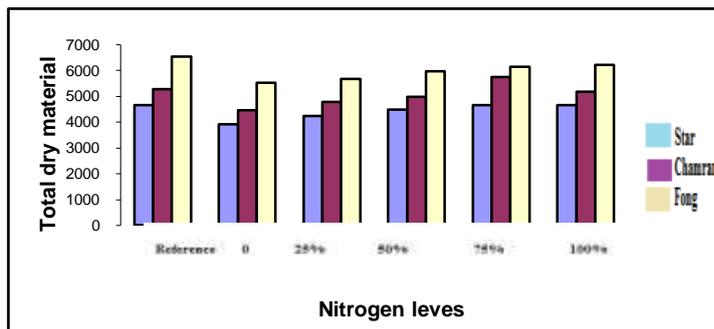


Figure 2: Comparison of the amount of dry matter produced in the second sampling (90 days after planting)

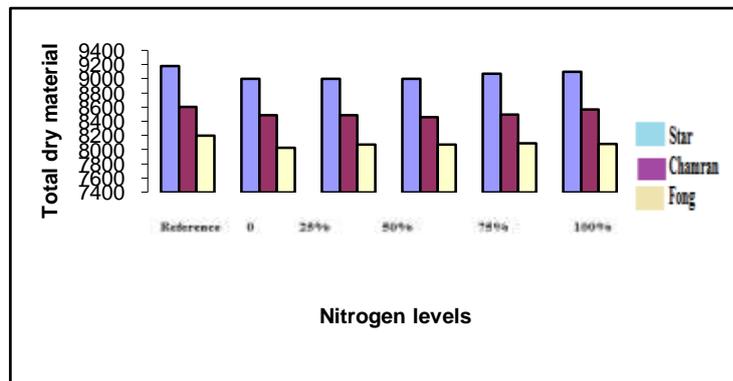


Figure 3: Comparison of mean values of dry matter at harvest time (120 days after planting)

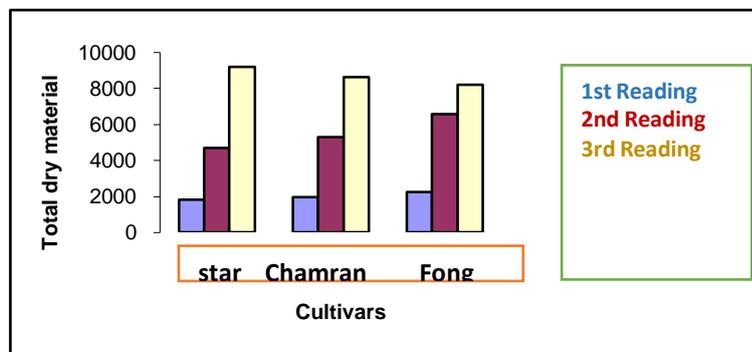


Figure 4: The process of dry matter production in three wheat cultivars in three samples

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## REFERENCES

1. Hosseini, Z. 1999. Common methods of food analysis. Shiraz University, 35 p.
2. Hussain, F. ,K. F. Bronson, Y. Singh, B. Singh, and, S. Peng. 2000. Use of chlorophyll meter sufficiency indices for nitrogen management of irrigated rice in asia. *Agron J.* 92:875-302.
3. Imam, Y. 2003. Agriculture grain, Shiraz University Press, 166 p.
4. Imam, Y, and Nik Nejad, M,. 1994. Introduction to the physiology of the crop and Shiraz University Press, 495 p.
5. Kochaki, AS. Rashid Mohassel, M. H. Safiri Mahallati, and the Sadr Abadi, R. 1994. Principles of physiological growth of crops, Astan Quds Razavi Publications, 562 p.
6. Khajehpour, M. R. 2002. Principles of Agriculture. Press (SID) of Isfahan, 536 p.
7. Kochaki, AS. 1993. agriculture in arid areas. Publications SID Mashhad (translation), 202 p.
8. Lioyd Murdock et al. ., 1997. Using a chlorophyll meter to make in wheat cooperative extension service university of Kentucky-college of Agricdture Lexington. Ky.
9. Lopez-Bellido R. J. and P. B. Barraclough, C. E. Shepherd1 (2001) Predicting post-anthesis N requirements of bread wheat with a Minolta SPAD meter *European Journal of Agronomy* . 65: 313-320.
10. Reeves,J. T. 1954. some effects of spraying wheat urea. *Journal of Australian Institute of Agricultural Sciences* 20:41-45.
11. Van den Berg, A. K, T. D. Perkins . 2004. Evaluatin of a Portable chlorophyll meter to estimate chlorophyll and nitrogen in sugar maple (*Acer saccharum Marsh*) leaves. *Forest Ecology and management* 200:113-117.