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Effect of caffeine supplementation on Immunity response of male broilers chicks

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Abstract: Caffeine added to drinks and food as a stimulator drug, and causes HCL secretion in stomach, hypertension and dilated blood vessels. In this experiment 200 1-d-old broiler chicks were randomly assigned to 4 dietary treatments (5 pens/ treatment of 10 male broilers each) in a completely randomized design. First treat was a control and the next three dietary treatments were supplemented with caffeine: 2) 0.5%, 3) 1.00%, 4) 2.00%. Broiler starter, grower and finisher diets, based on corn and soybean meal, were formulated, pelleted, and fed ad libitum. To assess humeral immune response, evaluation of antibodies against sheep red blood cell (SRBC) on days 36 and 42 were used and to cellular immunity, Coetaneous Basophile Hypersensitivity (CBH) was used. All data were analyzed by the analysis of variance general linear models procedure of SAS/STAT software and when treatment means were significant ($P < 0.05$), Tukey's multiple range tests was used to compare means. Before analysis, the univariate test was used to assess the normality of all data. Results show that caffeine supplementation significantly increased humeral immune response, and 0.5% caffeine induces maximum IgM in 42d. Although cell mediated immunity significantly decreased with inclusion level of caffeine in day 14, and maximum cellar immune response were shown with 0.5% caffeine supplementation. It was concluded that 0.5 caffeine supplementation cause maximum humeral and cell mediated immune response in 42 and 14d, respectively.

***Keywords*: broiler, caffeine, immunity response.**

I. INTRODUCTION

wo types of innate immune responses including humeral Tand cell-mediated immunity that there are different components of the immune system and removed different kinds of germs with the various activities. Humeral immunity mediated by molecules called antibodies in the blood and mucus which creates with lymphocytes B (B cell). Antibodies identify microbial antigens, counter their pathogenesis and as targets for elimination of microbes convert their enforcement mechanisms. Humeral immunity was the Primary defense mechanism against extracellular microbes and their toxins. They are capable of secreting antibodies that bind to microbes and their toxins and cooperate to remove them. Antibodies are molecules with a variety of different enforcement mechanisms to enable them to be activated. For example, some types of antibodies are accelerated the ingestion of microbes with host cells (phagocytes) and others led to the release of inflammatory mediators from these cells. Cell-mediated immunity is also called cellular immunity as lymphocytes T (T-cell) are responsible for creating them. These cells recognize antigens and intracellular microbes and involved in the destruction of infected cells and microbes. T cells do not produce antibodies. Their antigen receptors are transmembrane molecules that are functionally different but structurally related with antibodies. The purpose of this study was to determine the optimal dose of caffeine supplementation to enhance humeral and cellular broilers immunity response.

II. THEORY AND LITRETURE

There was no re liable published data on caffeine usage and the effects of caffeine supplementation on immunity response in male broiler chickens, so, more research was needed in this case. Studies on the effects of opioid drugs on the immune system either on experimental animals or in vitro on cells isolated from human represents a adverse effect on activity and create a weak immune system against

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Table 1. Feed Ingredients (%) and calculated analysis (%) of the experimental diets.

ingredients	starter	Grower	Finisher
Corn (%)	51.02	53.82	55.51
SBM (%)	39.91	36.52	34.77
Soy oil (%)	4.45	5.80	6.29
Dical. Phos. (%)	1.87	1.64	1.53
Limestone (%)	1.09	0.86	0.80
Salt (%)	0. 38	0.37	0.37
L-Lysine (%)	0.29	0.15	0.01
Mineral & Vitamin Mix[1] (%)	0.5	0.5	0.5
DL-Met (%)	0.38	0.29	0.22
L-Thre (%)	0.10	0.05	-
Calculated Analysis			
ME (Kcal/Kg)	3025	3150	3200
Protein (%)	22.57	21.06	20.19
CF (%)	3.94	3.76	3.68
EE (%)	2.26	2.34	2.39
Calcium (%)	1.05	0.90	0.85
Avail. Phos (%)	0.50	0.45	0.42
Potassium (%)	0.95	0.89	0.86
Sodium (%)	0.16	0.16	0.16
Lysine (%)	1.43	1.24	1.09
Met (%)	0.71	0.61	0.52
Met+cys (%)	1.07	0.95	0.86
Trep (%)	0.32	0.30	0.29
Arg (%)	1.45	1.35	1.30
Tre (%)	0.94	0.83	0.76

infectious agents causing the effect of these substances (8, 12). The effects of opioid drugs on immune cells, some researchers on this view that the effects of these receptors occurs through activation of peripheral opioid receptors (3, 4), Other researchers are rejected opioid receptors involved in the effects of these drugs on the immune system cells. Jessop et al. (1991) according to The study on the effect of morphine sulfate on mouse immune cells is believed That the in vitro inhibitory effect of opioid component on the activity immune cells are directly involved and opioid receptors on in these effects do not influence and these effect doesn't occur due to their toxicity (5). Vallejo et al. (2004) believed that opioid drugs acts as the same as cytokines and their effects on the immune system cause through receptors in the central and peripheral nervous system. According to them, opioid drugs had inhibitory effects on humeral and cellular immune system. Despite the NK cells and produced opioid substances within the body have the opposite effects that moderated these effects (7).

III. MATERIALS AND MWTHODS

Bird Management and Experimental Design

This experiment was conducted to assess the effect of caffeine on immune response of chickens from hatching to 42 days of age in a completely randomized design (CRD) with seven dietary treatments. This study was carried out over a 6-week period, using a total of 200 1-day-old chickens of a commercial genotype (Ross 308). After incubation of chicks delivered from local institutions and entrance hall, weighed, and with the same average weight (36.5 g ± 0.50) to ten pieces were distributed in 35 single cages. Treatments were three level of caffeine (0.5, 0.1 and 0.2) prepared from Sigma-Aldrich Chemie GmbH and control treats. Broiler chickens were monitored twice-daily for general health. The experimental protocol was reviewed and approved by the Animal Care Committee of the Ferdowsi University of Mashhad, Iran.

Immune Response Measurements

Analysis of Antibody Production to SRBC

Antibody production against SRBC was measured at the 30 and 36 d of age. Chicks were injected with 0.1 mL of BW 0.25% SRBC in 0.9% saline into the brachial vein of 2 chicks per cage. The same birds were vaccinated with SRBC at both time points. Six days after each immunization, blood was collected in nonheparinized tubes by puncturing the brachial vein. Serum was obtained by centrifuging at 1,500 × *g* for 15 min at 25°C, and stored at −20°C until assayed. Individual serum samples were analyzed for circulating anti-SRBC antibody titers by ELISA technique using commercial kits, and the plates were read at 405 nm on an ELISA reader. All titers were expressed as the log2 of the reciprocal of the serum dilution.

Coetaneous Basophile Hypersensitivity

CBH elicited in chickens by an intradermal injection of PHA-P is mediated in part by T cells. PHA-P was dissolved in sterile PBS. In this study we compared the CBH responses at different concentrations of injected PHA-P the interdigital area of the foot. The CBH response to PHA-P was evaluated by measuring the skin thickness in the injection site 24 and 42 h post injection by using low pressure calipers. Data are reported as the difference percent between skin thickness of the PHA-P and the PBS-injected sites.

Statistical Analyses

All data were analyzed by the analysis of variance (ANOVA) general linear models procedure of SAS/STAT software (SAS Institute, 2001) and when treatment means were significant ($P < 0.05$), Tukey's multiple range tests was used to compare means. Before analysis, the univariate test was used to assess the normality of all data.

Provided per kg of diet: vitamin A, 3,600,000 IU; vitamin D_3, 800,000 IU; vitamin E, 7,200 IU; vitamin K_3, 800 mg;

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vitamin B_1, 720 mg; vitamin B_2, 2,640 mg; vitamin B_3, 4,000 mg; vitamin B_5, 12,000 mg; vitamin B_6, 1,200 mg; vitamin B_9, 400 mg; vitamin B_{12}, 6 mg; vitamin H_2, 40 mg; choline chloride, 200,000 mg; Mn, 40,000 mg; Fe, 20,000 mg; Zn, 40,000 mg; Cu, 4,000 mg; Se, 80 mg. [3]To change MJ/kg to kcal/kg, multiply the values by 239.

IV. RESULTS AND DISCCUSIONS

The results of caffeine supplementation on humeral immune response on male broiler chicks were illustrated in table 2. Results show that different caffeine supplementation level had no significant effects on humeral immunity in 36 d ($P > 0.05$). Caffeine supplementation significantly increased IgM as compare with the control treat ($P < 0.05$). Low dose of caffeine supplementation (0.5%) significantly increased IgM as compare with the other treats ($P < 0.05$), which may indicate improved immune response in broiler chicks. This result is in contrast with the Eisenstein and Hilburger (1998) which show that opioid drug decreased immunity response (1).

The results of caffeine supplementation on cell mediated immunity were shown in table 3. Results show that caffeine addition had no significant effects on cellular immunity 24 h after 14 and 40 d injection ($P > 0.05$). Caffeine supplementation (2%) decreased cellular immune response 48 h after injection in day 14 ($P < 0.05$). Results show that 0.5% caffeine supplementation as compare with the other levels had higher cell mediated immunity response in day 14.

V. CONCLUSION

In summery, it was concluded that 0.5 caffeine supplementation cause maximum humeral and cell mediated immune response in 42 and 14d, respectively.

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Table 2. Effect of caffeine supplementation on humeral immune response in male broiler chickens.

	36 d			42 d		
	IgT	IgM	IgG	IgT	IgM	IgG
Treatment 1	4.00	1.00	3.00	3.00	0.50[b]	2.50
Treatment 2	4.00	1.00	3.00	4.00	2.00[a]	2.50
Treatment 3	2.50	0.50	2.00	0.50	1.00a[b]	4.50
Treatment 4	4.00	1.00	3.00	4.00	1.00a[b]	3.00
SEM	0.419	0.125	0.313	0.580	0.226	0.534
P	0.60	0.47	0.70	0.60	0.05	0.46

[1] Interactions are: 1, control. 2, 0.5% caffeine, 3.1.00% caffeine, 4. 2% caffeine.
[2] a-c Means in each column with no common superscripts are significantly different (P< 0.05).

Table 3. Effect of caffeine supplementation on cell mediated immune response in male broiler chickens.

	14 d		40 d	
	24 h	48 h	24 h	48 h
Treatment 1	114.99	103.76[ab]	111.17	106.31
Treatment 2	124.81	116.60[a]	120.47	110.68
Treatment 3	121.16	107.35[ab]	124.22	104.05
Treatment 4	112.78	97.94[b]	133.94	112.27
SEM	2.488	2.832	4.838	2.008
P	0.34	0.05	0.51	0.54

[1] Interactions are: 1, control. 2, 0.5% caffeine, 3.1.00% caffeine, 4. 2% caffeine.
[2] a-c Means in each column with no common superscripts are significantly different (P< 0.05)

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Determining the land suitability of two irrigated products of wheat and corn by parametric method (Storie and square root) and simple constraints in the region of Kamin, Saadat Shahr – Fars province

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Abstract— In this study, the land suitability in the area of Kamin, Saadat Shahr in Fars Province was conducted in a parametric method (Storie and square root) and simple constraints for two irrigated products of wheat and corn in eight soil profiles and the results indicated relatively good classes and critical suitability.

Keywords— land suitability, Sustainable development, environment, soil, wheat and corn.

I. INTRODUCTION

Soil is one of the blessings of God that should be kept properly in order to remain for the future generations. One of the important aspects of soil science is land suitability that is of great importance to sustainable development because it produces the agricultural or horticultural products with more functions and therefore more profit. On the other hand, it reduces the environmental hazards such as soil erosion, soil contamination, and soil salinity and..... by selecting the best product in the fields. Undoubtedly when a suitable product is selected by considering all aspects of planting, it is one of the crucial factors in sustainable development and environmental protection.

Land evaluation may be defined as “the process of evaluating the role of land when it is used for a specific purpose." and it includes all methods that predict the potential ability of using lands. Land Evaluation determines the ground reaction toward specific productivity. With Land Evaluation, the relationship between land and its productivity is determined. Then, based on this relationship, its suitable usage can be found and the estimate of the amount necessary inputs and resulting outputs can be achieved. In today's world, due to the increasing population growth and urban development the possible expansion of the cultivated area is reduced and therefore a strong need for efficient use of available land will be felt.

II. objective

The purpose of this experiment is: 1 - Comparison of wheat and corn in terms of environmental sustainability and the lowest risk of attrition and environmental and the highest production yield and 2 - Comparison of land suitability with different methods such as simple constraints and parametric.

III. Theory and Review of literature

Agricultural land, the need for efficient use of land can be felt more than ever. Sustainable agriculture is realized when the lands are classified in terms of suitability for different types of land uses [4]. The term “land suitability evaluation” was introduced for the first time in 1950 at the first International Congress of Soil Science, Amsterdam in an article entitled “Assessment of future land development” [8]. The main objective of land evaluation is that each land is used efficiently with the study of physical, social and economic aspects [1]. The classification of land suitability is a review of natural resources such as water, air, soil, water and human, economic, social and agricultural resources [7]. Wilson and Becker [9] conducted a Soil survey and land evaluation in Australia with the aim of achieving sustainable development. n this study, climate, geology, hydrology, vegetation and soil

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characteristics as the main factor of introduction and efficiency of terrain types, including products such as the South American palm, mango, avocado, citrus and other crops such as tea, vegetable, cucurbit, pineapple, etc. were introduced. Kooyama [5] conducted a study to determine land suitability in Mambetso in Japan and examined the land unsuitable for agriculture and land suitability for specific uses. The main objective of this project was to find the best land use for sustainable development.

Malek Zwaiski [6] conducted a geological and ecological assessment for agriculture in the area with the aim of achieving sustainable development based on planning, land used primarily for urban, regional, environmental, and then fit the capabilities of each region. The main objective of land evaluation is to use each land efficiently with the study of physical, social and economic aspects [1]. Qiyasi Shirazi [3] examined the land suitability of Moore plains in Fars province and determined the type of soil found in the three physiographic hills, alluvial fans and alluvial plains and specify a range of ten families in the soil for the three physiographic units and Stated that the proportion of families where there are mounds of physiographic units for the cultivation of wheat and barley, inappropriate or out of proportion a crisis. And families, who physiographic units are alluvial fans and alluvial plains range, are suitable for the cultivation of wheat and barley. Choosing the best product with the highest performance yet low environmental impact resulted in the study of land suitability both products irrigated wheat and maize parametric method (Story and square root) and simple constraints in Kami, Saadat abad region. In simple constraints, the table of needs for each product is prepared in which the vertical portion is the land features and the horizontal portion is the classes , Then each factor is compared with the situation on the ground and it is characterized by an agent.

Constraints method with the certain constraints is like the simple constraints.

Lands in the two systems are divided into two categories of proportionate S and disproportionate N. proportionate category is divided into three classes.

S1: proportionate class, S2: relatively proportionate class, S3: proportionate class but with a low profit

Disproportionate category is divided into two classes.

N1: Currently disproportionate but will be proportionate after removal of the restrictions. N2: disproportionate.

In this method, a quantitative ranking is given to each index if the characteristics are quite favorable for the plant the maximum degree of 100 is given to it and this evaluation method has two sections.

1- Assessment of Climate 2 - Assessment of land features

At this stage, the climatic factors that vary for each plant are identified, then the climatic conditions are compared to the climate needs of plant and a rank is given to it according to the table.

In the storie method, the index is obtained by the following procedure.

$$I = A\times B/100\times C/100\times \ldots$$

I: climate index of land suitability

A, B, C: Dedicated degrees to the different features of climate

In the method of the square root the index is obtained through the following equation.

$$I = Rmin\times \sqrt{A/100\times B/100\times.....}$$

I: Index

Rmin : minimum degree

A, B… :other degrees

The obtained parameters can be converted to degrees of climate using graphs.

If the climate index is less than 25: climate degree=1/6 × Climate Index

If the climate index is between 25 to 92.5: climate degree= (16.67 × Climate Index) ×0.9

IV. Materials and Methods

The region of Saadat Shahr with the area of approximately 14260 hectares is limited to About 80 km northeast of Shiraz between 52 degrees and 51 minutes to 53 degrees 13 minutes east longitude and 30 degrees north latitude 30 degrees 9 minutes north of the mountain gorge in the mountains and forests of East arsanjan of south to the mountains of West Mount Sivand. The average height plain from sea level is 1770 meters. In the study area using aerial photographs, satellite and topographic profiles of 8 controls were selected physicochemical properties in the laboratory and on-site features necessary for determining land suitability profile and climate data were collected from the study area for land works will be mentioned later.

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Table 1- Climate information for different stage of wheat

Suitability rate	Regional information	
100	292	Growing season rainfall(mm) 6/20 - 11/6
100	285.82	Vegetative stage rainfall(mm) 4/19 - 11/6
100	2.65	Flowering stage rainfall(mm) 5/5 - 4/19
100	0.49	Ripening stage rainfall(mm) 6/20 - 5/22
97.47	10.03	Average temperature of vegetation (°c) stage
96025	20	Average temperature of flowering stage (°c)
93.34	25	Average temperature of ripening stage (°c)
100	-0.6	average minimum daily temperature of the coldest month (°c)
100	12.7	average maximum daily temperature of the coldest month (°c)

Table 2- Relation between land indices and Suitability class

Suitability class		indices
S_1	Suitable	75-100
S_2	Rather Suitable	50–75
S_3	Critical Suitable	25–50
N	Unsuitable	0–25

Description: As the result of the wheat crop irrigation method is desired, so the first 4 parameters such as rainfall + irrigation artificially supplied, so the maximum amount to be given. Climate index: 1 × 1 × 93.34 = 93.34 with respect to the index is not between 25 and 92/5 it will remain unchanged. The characteristics and the degree of severity of climate and terrain profiles obtained by the two methods are achieved Story and the square root of the index. And the overall grade will be determined according to Table 2.

Table 3- Climate information for different stage of Maize

Suitability rate	Regional information	
100	302	Annual rainfall(mm)
95	178	Number of growing season days 12/19 - 6/22
100	79.82	Growing season rainfall(mm) 12/19 - 6/22
90	20.85	Average temperature of growing season stage(°c) 12/19 - 6/22
90	12.05	Average minimum temperature of growing season (°c) 12/19 - 6/22
75	37.7	Relative humidity of development stage 10/4 - 8/9
94	53.33	Relative humidity of maturation stage 12/19 - 10/12
100	0.53	n N development stage
100	0.78	n N ripening stage

Description: As the result of the maize crop irrigation method is desired, so annual rainfall and growing season rainfall like the wheat maximum amount to be given (100)

. Climate index: 75 × 0.9 × 0.95 = 64.13. With respect to the index is between 25 and 92/5 it will remain with this formula changed. The formula is

(Climate Index × 0.9) + 16.67= Climate rate

Climate rate =74.39

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Table 4- Profile information

ESP	EC[2]	O. M	B.S	CEC[1]	Gypsum%	C.C.E	Depth (cm)	Gravel and Stony	Soil Texture	Fludity	Slope %	Profile 1
3.91	0.84	1.25	100	23.84	0.057	8.75	130	No limitation	Silty Clay Loam	No limitation	2%>	A
6.54	1.52	1.07	100	17.38	0.057	44.5			Silty Clay Loam			B_{k1}
9.19	1.51	1.01	100	15.80	0.053	46.87			Silty Clay			B_{k2}
6.92	0.84	0/68	100	12.53	0.052	44.25			Silty Clay			B_{K3}
6.5598	1.0998	1.0787	100100	18.1197	0.055100	31.4582	100	100	99	100	100	Wheat
99	99	87	100	89	100	50	100	100	98	100	100	Maize

Table5- Index number for wheat and maize

Index number for maize		Index number for wheat		Profile number
Square root	Storie	Square root	Storie	
37.19	27.66	70.96	61.41	1
0.84	0.29	3.69	0.91	2
33	26.83	65.43	56.98	3
16.41	12.25	45.89	37.46	4
6.29	5.05	21.53	18.55	5
11.71	9.14	42.03	38.98	6
20.08	16.12	67.96	62.42	7
7.44	2.77	4.03	0.9	8

According to Table 2 and having indices, Land Suitability Class for all of profiles easily can be obtained. The results are available in the table 6.

Table 6- suitability classes for wheat and maize

Suitability Classes for Maize			Suitability Classes for Wheat			Profile numbers
Simple constraints	square root	storie	Simple constraints	square root	storie	
S_2	S_3	S_3	S_2	S_2	S_2	**1**
N	N	N	N	N	N	**2**
S_3	S_3	S_3	S_3	S_2	S_2	**3**
N	N	N	S_3	S_3	S_3	**4**
N	N	N	N	N	N	**5**
N	N	N	S_3	S_3	S_3	**6**
N	N	N	S_2	S_2	S_2	**7**
N	N	N	N	N	N	**8**

V. Conclusion and recommendations

According to the results we can say that if wheat is planted in the profile (1), we also have more functionality than the corn and also the environmental problems in less or no wheat, no corn, and no profile number 5 is not recommended.

[1] - Cmol (+) Kg^{-1}
[2] - $dS.m^{-1}$

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Depending on other conditions for wildlife or recreation is highly recommended. Story method is preferable because it deals with numbers and can be considered semi-quantitative manner than the simple constraints approach. It is recommended to evaluate the future research and quantitative assessment of the economic and many other products in order to have more choice between products, and the economic and quantitative methods to assess.

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The Effect of Different amounts of phenylalanine and tryptophan amino acids on agricultural characteristics of corn(*Zea mays* L.)

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***Abstract*—** In order to determinate of the effects of different amounts of phenylalanine tryptophan amino acids on corn (*Zea mays* L.) was conducted and experiment as split plot-factorial in based on randomized complete block design with three replication. the treatments were consisted of two the foliar spray application times(4-6 and 8 leave stages),as the main factor and with of the phenylalanine and tryptophan amino acids(0,50,100 and 150 ppm),as a second factor. The results indicated that phenylalanine and tryptophan amino acids could showed significant effect on characters like grain yield, row number in ear, grain number in row and protein of each grain. The main comparisons indicated that the phenylalanine and tryptophan amino acids with concentration of 100 ppm caused significant increasing on characters under examination in the 8 leave stage these amino acids could improved the row number in ear, grain number in row, grain yield and protein rate in each grain by 12%.

***Keywords*—** Corn, phenylalanine and tryptophan amino acids, yield, protein.

I. INTRODUCTION

DUE to the importance of Corn for human and animal nutrition And wide compatibility with temperate and tropical climate zones, it would be One of the strategic crops[6]. increased of Corn cultivation during the last decades growing Compression systems of this corn with high requires nutrient has caused that In addition to excessive use of chemical inputs increased the production costs and environmental risks [1]. Given that amino acids are structure of the nitrogenous and Generally involved in chlorophyll synthesis And lead plant physiological relationships to reduce environmental stresses also be a good source for providing the activities of the plant in delicate situations of Growth and even during the grain filling will be able to affect the Components of functioning so well and to increase production efficiency [4]. By examining the results of experiments on pea plants by spraying ppm 100 of amino acid tryptophan cause the Protein increased. In addition amino acids has been able to increase the concentration of hormones such as auxin and gibberellin and Saytoknyn Texin acid [3]. On the other side phenylalanine amino acid with a concentration ppm50 has the best performers (Joseph, 2004). Probably grain led to a higher protein than starch [7]. According to impacts of amino acids phenylalanine and tryptophan to maintain the potential of plant in Forming rows of corn and create favorable conditions for the occurrence of the genetic potential of the

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plant, increase of the number of rows In the corn would not be unexpected [4]. If The spraying time at the stage before flowering and a little closer be less, The effect is more useful than the vegetative phase and the potential advantage in performance and yield components is possible [3]. In other experiments on barley indicated that Tryptophan with 100 ppm concentrations increase flowering, amino acid phenylalanine with 50 ppm concentration that had the highest yield [7]. And also in other studies the greatest increase in performance with 150 ppm concentration of tryptophan has reported [5]. Therefore, the present study aimed to evaluate the effects of the amino acid phenylalanine and tryptophan in agronomic traits of corn in two veins of SC 704 Firoozabad climatic conditions.

II. Materials and Methods

The research was done in a farm located in the village 5 kilometers of Firoozabad Jaydasht city located in Fars province in the summer of 2009. Desired station is in 36 minutes east of 52 degrees longitude 26 minutes north and 2852 degrees longitude at the height 1300 meters above sea level. Before running the test from zero to 30 cm depth soil was sampled and chemical and physical properties and chemical composition of the soil was determined (Table 1).been accepted, prepare it in two-column format, including figures and tables.

Table 1 - Analysis of soil physicochemical

N %	K ppm	P ppm	OC %	pH	EC ds/m	Saturation percentage	deep
0.04	190	7.1	0.68	7.82	1.45	24.71	0-30
0.03	98	2.6	0.52	7.91	1.37	26.02	30-60

Split-plot factorial experiment was conducted in a randomized block design with two levels of spraying time 6-4 leaf stage and two-leaf stage 8 as the main plots and the four amino acid phenylalanine and tryptophan individually (0, 50, 100 and 150 parts per million) as subplots. Experimental field were considered with dimensions of 20 × 50 square meters per plot 5/3 × 5 m. Each unit is consisted of 5 furrows, 7 stack in 6 m length with 70 cm distance. To prevent interaction treatments, distance between treatments was 2 meters. half of the Urea was added before planting and the remaining urea was added the ground in two stages. To combat weeds thin leaf herbicide atrazine after planting and before the first irrigation was applied. During harvesting hand weeding was used to combating with weeds. During Implantation the thinning operations was done in order to pass the potential attack of Egrotis in two stage of 4-3 leaf and the second stage in two 8-7 leaf. During the maturity stage for the determination of these parameters were sampled randomly from each plot.

1) seed yield with harvested plant was concluded from the two rows middle of each plot with removing of marginal effects in terms of 12% moisture.

2) measure of protein content was determined according to the following formula:

The dry samples were pulverized (1-5/0 grams) in 5 mL Tris Lyterbafer hydrochloric acid. The samples were centrifuged with high speed. 05/0 ml of the supernatant centrifuged samples was removed and 1 ml of a reagent has added (5/0 ml sodium tartrate 2% + 5/0 copper sulfate 1%+10 mL sodium carbonate and 10% sodium hydroxide solution at 0/5 Normal). And it was set at Laboratory temperature at 15 minutes. Then three ml of 2/0Folin reagent of above solution was added. The resulting solution were in Ben marry for 15 minutes at 50 ° C . The absorption rate read by a spectrophotometer (UV) wavelength of 625 nm Hitachi Model 2000 and to calculate the amount of protein the following formula was used:

$$M = \frac{C \times 0.005}{W} \quad (1)$$

M =amount of protein per gram of dry material, W =weight of sample, C =concentration

The data obtained by MSTAT-C statistical software for data analysis and comparison of means was done by Duncan test at 5% probability of error and graph drawing was done by Excel Software.

III. Results and Discussion

Grain number

In Table 2 it was observed that the time of spraying on grain yield were not significant. But it was significant with use of amino acid phenylalanine at 1%. On the other hand, with the amino acid tryptophan spray is also significant at 1%. by studying the Comparisons of mean in time I spraying that were coincided in 6-4 leaf stage of corn, Amino acid phenylalanine has the highest to treatment with the ppm 100 concentration and the lowest yield is control treatment. If we have a overview diagram (1) we will see with more amino acid phenylalanine concentration in the 6-4 leaf stage, it has ascending trend. After the peak, the concentration in ppm 100 has the reduce trend that caused significant differences between all levels of the treatments. According to the diagram (2) No significant difference has been seen in the amino acid phenylalanine in 8-leaf stage between treatments of ppm 150 and ppm100. However, there are significant differences between them and other treatments that trend with an increase of 25% - 20%. The graph (3) show the comparison of the amino acid tryptophan in the 6-4 leaf stage to maximum yield has been see in ppm 100 concentration. However, no significant difference has not see between treatments ppm150 and ppm100 ppm 50. And only significant difference was between the control treatments and other treatments. By examining the diagram (4) of spraying amino acid tryptophan in the first stage, the 6-4 leaf stage of corn grain is found

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maximum yield with a concentration in ppm 100. And it has lower excellence to Treatments of ppm 150 and ppm50. Therefore, the significant mean difference was not found between the three concentrations. But all concentrations were significantly different from control. Given that amino acids are the structure of the nitrogen-containing Generally involved in the synthesis of chlorophyll and lead to plant physiological relationships to reduce environmental stresses, On the other hand it was a good source of providing plant operations and in sensitive conditions of growth and even during the grain filling will be able to affect the yield components and yield. And increase production efficiency [4]. Figure (5) shows the interaction of amino acids in the 6-4 leaf stage. With increasing of concentrations of tryptophan to 100 ppm and the other side increasing of phenylalanine concentration to 150 ppm Integrated will intensify each other's effects. And it is with The increase of performance. This difference was significant, but there is no significant difference in treatments with high concentrations. The results obtained from the diagram (6) will show the better results in concentration of the amino acid phenylalanine in100 ppm with the combination of amino acid tryptophan - 150 ppm 100 ppm 50 ppm. However, compared of treatments shows significant differences between treatment and control concentrations with using of amino acid.

Grain number in row

According to Table 2, sprayed on Grain number in rows is not significant. And the amino acid phenylalanine in 1% level is the same as amino acid tryptophan in 1% level. According to the diagram (7) sprayed at 6-4 leaf amino acid phenylalanine has the highest increase grain number row in related to the concentration ppm100. However, a significant difference was not seen between the two treatments 150 ppm but it showed a significant different with treatment 50 ppm and control groups. Considering the diagram (8) with the amino acid phenylalanine in the 8-leaf stage of corn the highest increase was seen at concentrations of ppm 100 and ppm150. And there is no significant difference between them, but significant difference has been found in the treatment 50 ppm and control with other treatments. According to the diagram (9) of the amino acid tryptophan in the 6-4 leaf stage, the maximum number of grain rows with a concentration in ppm 100 shows significant difference with other treatments. On the other hand, a significant difference was between the other treatments. Figure (10) created The maximum grain number in row with the amino acid tryptophan in the 8-leaf stage and the concentration showed a significant difference with other treatments. And above diagram will show a high number of seeds per row. The results of Figure (11) interaction, number of grain in rows 6-4 leaf stage has increased the number of grains per row with increasing concentrations of the amino acid composition. And the maximum concentrations of ppm 100 has occurred. This suggests that the interaction with the relative growth of 9% compared to treatment with a single concentration has a comparative advantage. By observing the diagram (12) Interaction of 8 leaf stage of grain rows has the Most amino acid phenylalanine concentration in ppm 100 ppm and 150 or ppm 100 amino acid tryptophan. With increase of concentrations of ppm50 to other levels of solution concentration airbrush there have been significant different.

Number of rows in the ear

According to Table 1 can be seen that time of sprayed on the trait number of rows In the ear was not significant. In sprayed with amino acid phenylalanine traits in the ear rows are significant at 1%. And significant has been observed at 1% at the amino acid tryptophan. The comparison has been observed between the maximum number of rows In the ear ppm100 concentration of the amino acids phenylalanine and tryptophan amino acid treated with a concentration in ppm 100. And Control treatment is the least. Looking at the diagram (13) of the amino acid phenylalanine in the 6-4 leaf stage of corn , the highest number of rows observed In the ear and ppm 150 ppm 100 concentrations that there is no significant differences between two treatments. However, there is a significant difference between treatment and control treatment in ppm 50. According to the diagram (14) above the amino acid phenylalanine 8-leaf stage with a concentration in ppm 100 is superior to other treatments. However, significant differences between the treatment with ppm 150 concentration is not seen and as well as the significant differences between the control and ppm 50 in 8-leaf stage have not been found. The diagram (15) shows no significant differences in amino acid tryptophan in the 6-4 leaf stage of ppm 150, ppm 100 concentration. However, this differences has shown the significant with other concentration. And no significant difference found between the treatment control and ppm 50. As can be seen in diagram (16) they do not show a significant difference between treatments and ppm 100, ppm 50, ppm 150 that the maximum number of rows can be seen per grain. The amino acid tryptophan in the 8-leaf stage, is able to provide the number of rows In the ear in a high level and uniformity. The only significant difference was seen in the control treatment. Investigating the diagram (17) Interaction spray solution concentrations were observed in the number of rows in the ear combined with increasing concentrations of each amino acid is associated with an increase in the number of rows In the ear. The highest plant response is achieved in concentration ppm 100 amino acid tryptophan and concentration ppm 100 the amino acid phenylalanine. Looking at the diagram (18) the Interaction of 8-leaf stage of in the ear rows, will increase with increase of concentration. However, there is no significant difference between treatments with high concentrations, and each of them showed a significant

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difference with control treatment. The results of experiments conducted in order to increase the number of flowering and more seed was measured as a yield. It is shown that it is with efficiency of 10%.

Grain protein

According to the table 2 found that the time of sprayed on grain protein is significant at 5% level. Using the amino acid phenylalanine was significant at the 1% level and this significant are observed amino acid tryptophan at 1% level. diagram (19) showed significant difference In comparison the average amino acid phenylalanine sprayed at 6-4 leaf stage of the concentration, ppm 100 with the other treatments. However, no significant difference between treatments ppm50 and ppm 150 have been found. But in treatment control is a significant difference. In view of the diagram (20) observed that there is a significant difference between all levels of treatments. And the highest grain protein concentration of the amino acid phenylalanine ppm100 has been reached at 8 leaf stage. According to the diagram (21) in the mean derived from the amino acid tryptophan in the 6-4 leaf stage of corn significant differences has not been between treatments with concentrations in ppm 150 ppm 100. But there are a significant difference with other treatments. in the diagram (22) in the amino acid tryptophan concentration in ppm 100 8-leaf stage there is a significant differences with other treatments. But there is no significant difference between treatment concentration ppm 50, ppm 150. This difference is more pronounced in control. The diagram (23) shows a significant difference between treatment and control also maximum grain protein are observed simultaneously concentration ppm100 of tryptophan and ppm100 of phenylalanine. Amino acid phenylalanine in concentrations ppm100 with others amino acid tryptophan concentrations relatively had better results with other concentrations. The results obtained from the diagram (24) in the 8-leaf stage, the interactions between amino acids that make a significant difference compared to control. But compared to each other increase will not be so much. But ultimately in ppm100 and ppm150 concentrations of each it is created the most protein simultaneously at this stage.

Table 2. Mean squares and significant levels of characters under examination

S.O.V	df	Grain yield	Row number in ear	Grain number in row	Rate of protein
Replication	2	681957.7	25.93	136.91	7.73
Spray time(A)	1	912362.76	23.20	95.52	6.43
Error(a)	2	273982.8	2.73	15.92	0.33
Phenylalanine(B)	3	18435603.8	17.11	126.33	1.66
Tryptophan(C)	3	146012008.5	15.66	183.33	1.55
A×B	3	1213073.28	10.129	118.852	0.852
A×C	3	1507649.33	12.259	165.146	0.991
B×C	9	2138868	11.333	139.331	0.733
A×B×C	9	1197580	16.279	104.123	0.828
Error(b)	60	258023.56	2.11	14.87	0.20
CV%		6.11	11.09	10.15	5.5

Significant in 1% and 5% level** &*

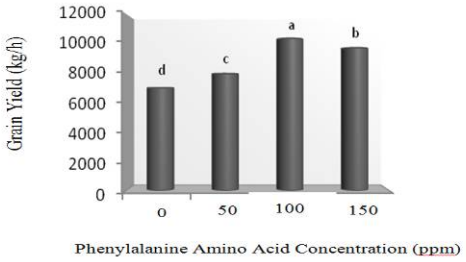

Fig.1. the main comparison of phenylalanine amino acid concentration in 4-6 leave stage on grain yield

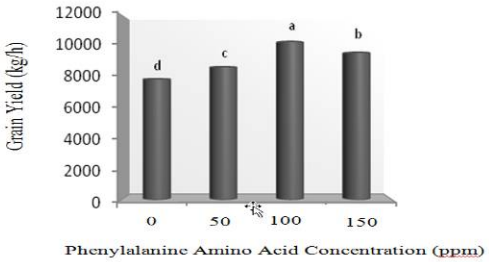

Fig.2. the main comparison of phenylalanine amino acid concentration in 8 leave stage on grain yield

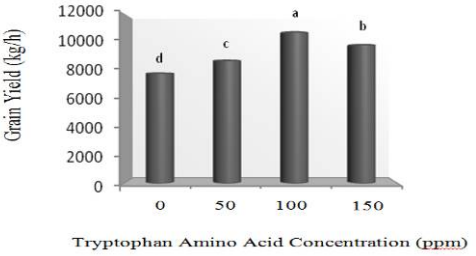

Fig.3. the main comparison of tryptophan amino acid concentration in 4-6 leave stage on grain yield

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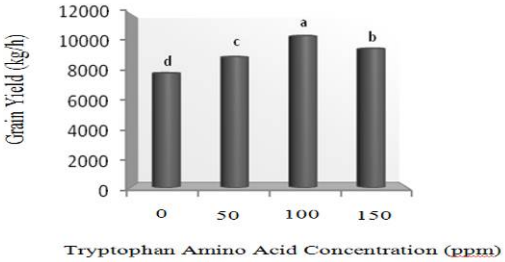

Fig.4. the main comparison of tryptophan amino acid concentration in 8 leave stage on grain yield

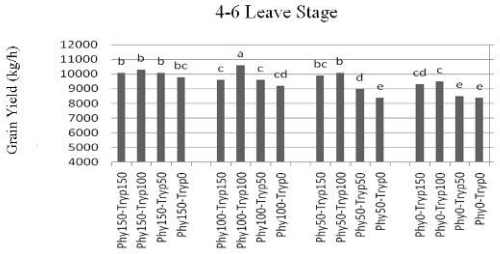

Fig.5. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 4-6 leave stage on grain yield

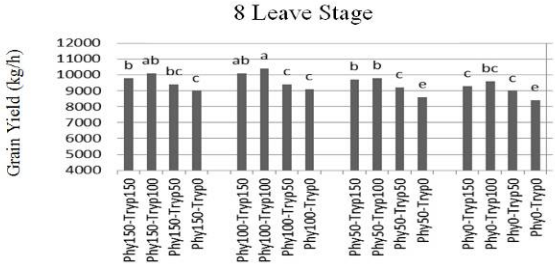

Fig.6. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 8 leave stage on grain yield

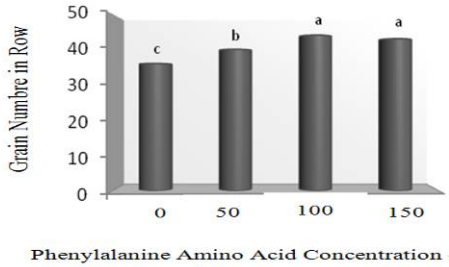

Fig.7. the main comparison of phenylalanine amino acid concentration in 4-6 leave stage on grain number in row

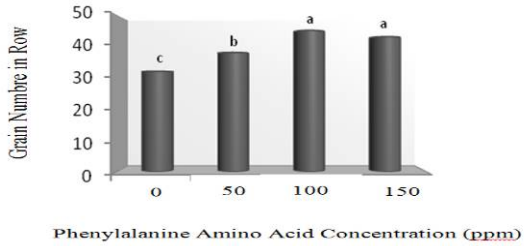

Fig.8. the main comparison of phenylalanine amino acid concentration in 8 leave stage on grain number in row

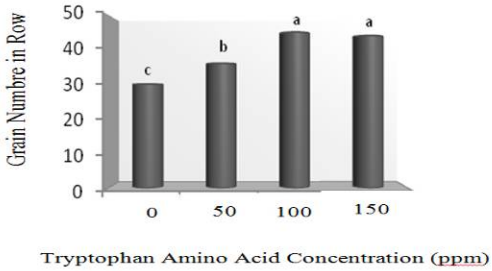

Fig.9. the main comparison of tryptophan amino acid concentration in 4-6 leave stage on grain number in row

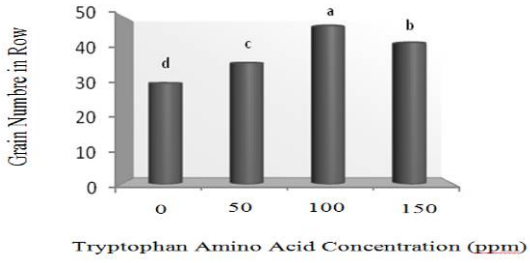

Fig.10. the main comparison of tryptophan amino acid concentration in 8 leave stage on grain number in row

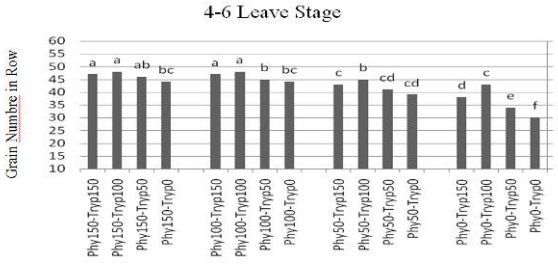

Fig.11. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 4-6 leave stage on grain number in row

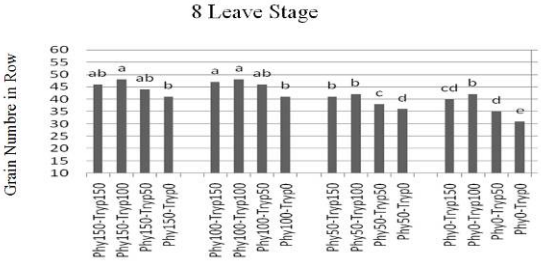

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Fig.12. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 8 leave stage on grain number in row

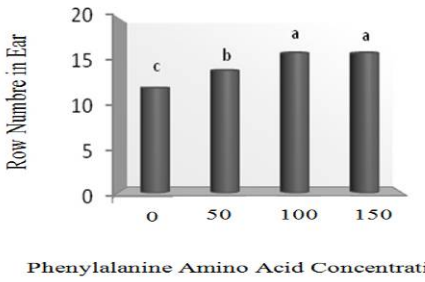

Fig.13. the main comparison of phenylalanine amino acid concentration in 4-6 leave stage on row number in ear

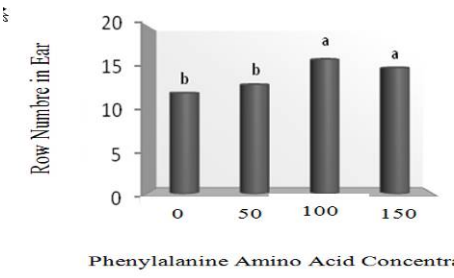

Fig.14. the main comparison of phenylalanine amino acid concentration in 8 leave stage on row number in ear

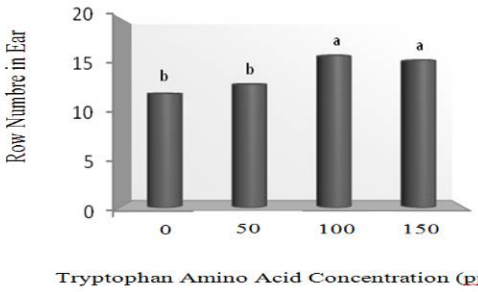

Fig.15. the main comparison of tryptophan amino acid concentration in 4-6 leave stage on row number in ear

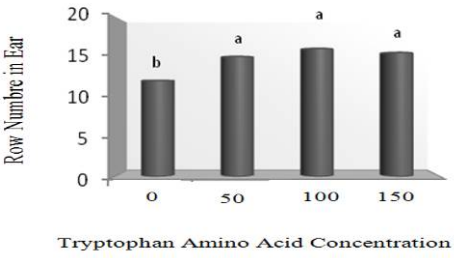

Fig.16. the main comparison of tryptophan amino acid concentration in 8 leave stage on row number in ear

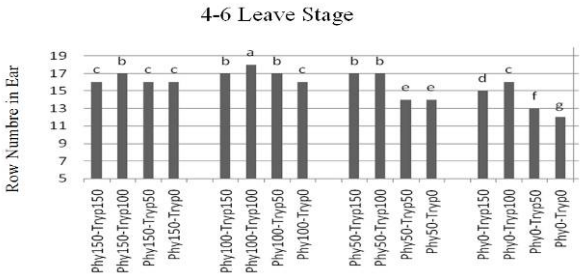

Fig.17. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 4-6 leave stage on row number in ear

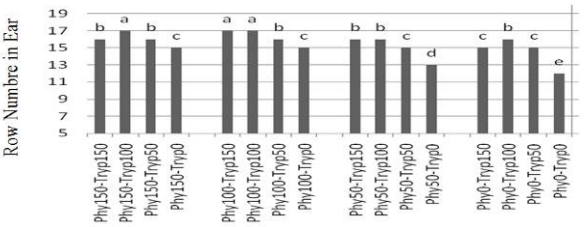

Fig.18. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 8 leave stage on row number in ear

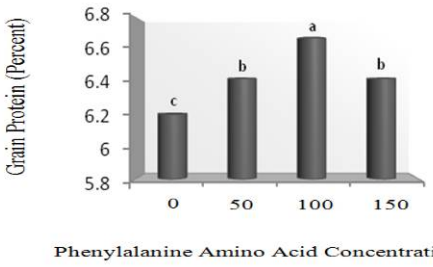

Fig.19. the main comparison of phenylalanine amino acid concentration in 4-6 leave stage on grain protein

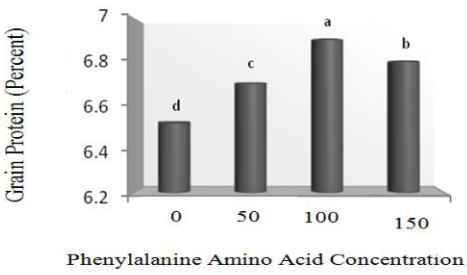

Fig.20. the main comparison of phenylalanine amino acid concentration in 8 leave stage on grain protein

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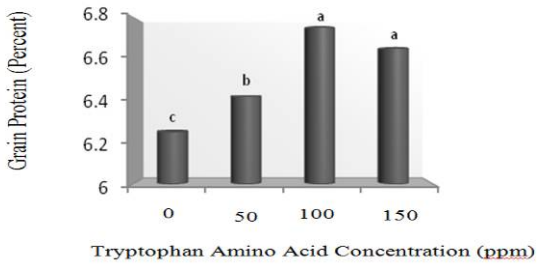

Fig.21. the main comparison of tryptophan amino acid concentration in 4-6 leave stage on grain protein

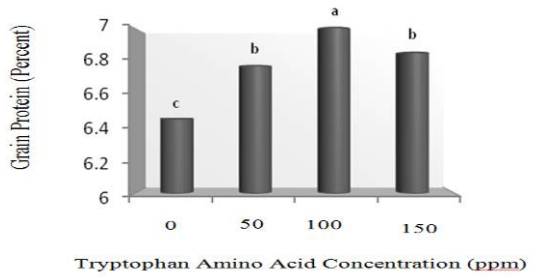

Fig.22. the main comparison of tryptophan amino acid concentration in 8 leave stage on grain protein

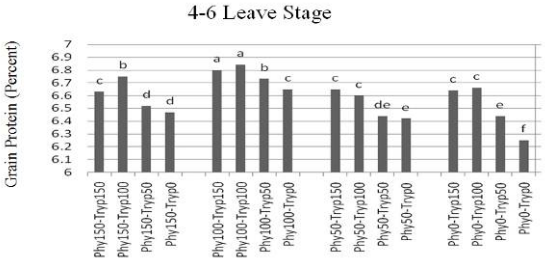

Fig.23. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 4-6 leave stage on grain protein

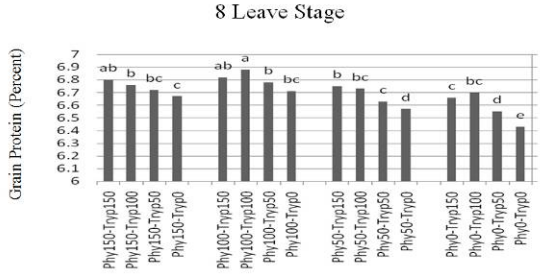

Fig.24. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 8 leave stage on grain protein

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The Valuate of Different amounts of phenylalanine and tryptophan amino acids on physiological characteristics of corn(*Zea mays* L.)

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***Abstract*—**In order to determinate of the effects of different amounts of phenylalanine tryptophan amino acids on corn (*Zea mays* L.) was conducted and experiment as split plot-factorial in based on randomized complete block design with three replication. the treatments were consisted of two the foliar spray application times(4-6 and 8 leave stages),as the main factor and with of the phenylalanine and tryptophan amino acids(0,50,100 and 150 ppm),as a second factor. The results indicated that phenylalanine and tryptophan amino acids could showed significant effect on characters like grain yield, row number in ear, grain number in row and protein of each grain. The main comparisons indicated that the phenylalanine and tryptophan amino acids with concentration of 100 ppm caused significant increasing on characters under examination in the 8 leave stage these amino acids could improved the row number in ear, grain number in row, grain yield and protein rate in each grain by 12%.

***Keywords*—** Corn, phenylalanine and tryptophan amino acids, yield, protein.

I. INTRODUCTION

DUE to the importance of Corn for human and animal nutrition And wide compatibility with temperate and tropical climate zones , it would be One of the strategic crops [9]. increased of Corn cultivation during the last decades growing Compression systems of this corn with high requires nutrient has caused that In addition to excessive use of chemical inputs increased the production costs and environmental risks [3]. The construction of IAA- is same as amino acid precursor for tryptophan, the indole -3 - glycerol phosphate. Both compounds have a role as a precursor in the construction of IAA. Molecular genetic studies and radioisotope labeling are to identify the enzymes and intermediate molecules that are involved in IAA tryptophan-dependent structural biology. And the their action has been used: the main three routes of plant and structural biology of bacterial pathway dependent on tryptophan- IAA are available . This directory contains two paths tryptamine (TAM) and

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indole pathway -3 - pyruvate (IPA) that are probably the most common pathways structural biology of auxin in plants [6]. Attoa (2000) stated, using a tryptophan amino acid with in ppm 100 concentration in Datura plant has increased dramatically plant growth tissue. That Indicate that changes in plant physiological processes. Other studies have been done to enhance leaf area index with amino acid phenylalanine in concentrations of ppm 100 , evidence that there is a significant increase compared to control [5]. The results experiments by combining two amino acids tryptophan and phenylalanine in leaf area and on increase of leaf area index and chlorophyll a and b and are similar . carotenoids confirmed other studies [10]. The results obtained on some plant species Datura arethe best results in leaf area index that is related to the concentration in ppm 100. In similar experiments, the best results are observed at a concentration ppm 100 [2]. In an experiment conducted on the amino acid tryptophan Fylodenderon plant at different concentrations obtained results Indicate increased plant growth, increased LAI in concentration of ppm 100 [1]. And in similar experiments involving treatment with highest leaf area index in concentrations ppm 50 and using amino acids tryptophan and phenylalanine spray can [4]. Therefore, the present study has been studied the effect of phenylalanine and tryptophan amino acids Physiological Indices of corn grown of two vessels SC 704 in climatic conditions of Firoozabad.

II. Materials and Methods

The research was done in a farm located in the village 5 kilometers of Firoozabad Jaydasht city located in Fars province in the summer of 2009. Desired station is in 36 minutes east of 52 degrees longitude 26 minutes north and 2852 degrees longitude at the height 1300 meters above sea level. Before running the test from zero to 30 cm depth soil was sampled and chemical and physical properties and chemical composition of the soil was determined (Table 1).

Table 1 - Analysis of soil physicochemical

N %	K ppm	P ppm	OC %	pH	EC ds/m	Saturation percentage	deep
0.04	190	7.1	0.68	7.82	1.45	24.71	0-30
0.03	88	2.6	0.52	7.91	1.37	26.92	30-60

Split-plot factorial experiment was conducted in a randomized block design with two levels of spraying time 6-4 leaf stage and two-leaf stage 8 as the main plots and the four amino acid phenylalanine and tryptophan individually (0, 50, 100 and 150 parts per million) as subplots. Experimental field were considered with dimensions of 20 × 50 square meters per plot 5/3 × 5 m. Each unit is consisted of 5 furrows, 7 stack in 6 m length with 70 cm distance. To prevent interaction treatments, distance between treatments was 2 meters. half of the Urea was added before planting and the remaining urea was added the ground in two stages. To combat weeds thin leaf herbicide atrazine after planting and before the first irrigation was applied. During harvesting hand weeding was used to combating with weeds. During Implantation the thinning operations was done in order to pass the potential attack of Egrotis in two stage of 4-3 leaf and the second stage in two 8-7 leaf. To study plant growth and plant communities in different treatments were done in 6 sampling for 10 days. The first sampling GDD (Growth-degree-day) is equal to 5/118 and the last sampling was done after obtaining GDD, 6/893. Destructive method was used for sampling at a time and five plants (typical) from the two central rows of each plot were harvested. Leaf area was measured by Device for measuring leaf area (leaf area meter). Dry weight was determined after being placed in the oven for 72 hours at 75 ° C. Air temperature stable index a degree - day development (GDD) were used to determine plant growth GDD that is calculated according to the following formula:

$$(1)\quad \sum_{1}^{n} GDD = \left(\frac{T\max + T\min - Tb}{2}\right) - 10$$

$$(2)\quad \text{Leaf Area Index} = \frac{LA2 - LA1}{T2 - T1}$$

$$(3)\quad \text{Leaf Area Duration} = \frac{LA2 - LA1}{2}(t2 - t1)$$

In this experiment, the base temperature (Tb) for corn, is considered 10 ° C. Physiological parameters for drawing graphs were plotted using Excel software.

III. Results and Discussion

Leaf area index (LAI)

LAI expression ratio of leaf area to ground area occupied by the crop, We realize the importance of this index due to production by solar energy and convert it into usable materials and other food mainly is available by leaves. LAI increase over time due to the production of new leaves and increased leaf area. But after reaching to a certain extent, begin to decline which varies for each species and environmental conditions. This decrease is due to Shedding of lower leaves of the plant mainly to low light to plant community .and decrease their photosynthesis. Sometimes the leaf photosynthesis was zero. And sometimes even becomes negative. In such a situation before leaves of plant become a parasite, with no added hormones will cause it to fall [4]. According to Table 1 has been observed that LAI at different times of spraying was significant at the 5% level. The amino acid phenylalanine in adjective LAI was significant at 1% level and the amino acid tryptophan in features LAI is significant at 1%. According to the diagram (1) comparison

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with the amino acid phenylalanine in the 6-4 leaf stage showed the highest LAI with treatment in ppm100 concentration. That is significantly different than other treatment. Other treatments also shows significant differences. According to the chart (2) comparison of the amino acid phenylalanine in the 8-leaf spray treatment the highest LAI is in concentration ppm 100. And minimum is related to control that shows significant differences among treatments. The results in Figure (3) comparison of the tryptophan amino acid in the 6-4 leaf stage of growth, Maximum LAI is treatment with concentration in ppm 100 and the lowest is control treatment. Treatment with concentration in ppm 100 has the significant difference with other treatments but treatment with concentration of ppm 50 with ppm 150 treatment was not significantly different. Also, the treatment of ppm 50 doesn't show a significant differences with control. According to the diagram (4) comparisons of the amino acid tryptophan in 8-leaf sprayed is the maximum LAI related to treatment with a concentration in ppm 100. The other treatments showed significant differences but both treatments ppm 50 and ppm 150 don't have a significant differences. phenylalanine Amino acid with phenolic compounds and alkaloids will improve aerial biomass in plants [7]. spray amino acid phenylalanine in 4-6 leaf stage of corn with increasing of 25% LAI in treatment with ppm 100 concentrations is shown relative to the control. But the 8-leaf stage is shown 14% increased by spray the leaf area index relative to the control (Figure 1 and Figure 2). According to the results in Figure (5) the effect of the amino acid tryptophan and amino acid phenylalanine in ppm 100 of amino acid tryptophan and phenylalanine 6-4 leaf stage shows the most leaf area index of treatments of acid concentration, ppm 100 amino acids tryptophan and phenylalanine that are used simultaneously. also the increased concentration of the control treatment, the interaction between any two amino acids in ppm100 will be accompanied with relative growth. By examining the diagram (6) were significantly showed the interaction between amino acids 8-leaf stage, leaf area index modulation of amino acid changes And shown Superiority treatment with different concentrations of the amino acid tryptophan simultaneously. According to the diagrams (3 and 4) about the use of the amino acid tryptophan in the first stage ppm100 treatment was associated with 45% compared to the control treatment. But the second step of spray (8 leaves), leaf area index increased by 13% is obtained compared with the controls.

Leaf area duration (LAD)

According to Table 2 have been observed in leaf area during in the time of spray it is significant at the 5% level. Amino acid phenylalanine, which was significant at 1% level that this significance is observed at 1% amino acid tryptophan. According to the diagram (7) significant difference was observed to the results of comparison of the amino acid phenylalanine in the first step spray (6-4 leaf stage) at concentrations of ppm 100, ppm 150, ppm50. However, a significant difference shown to compared with the control concentrations. By examining the graph (8) of the mean amino acid phenylalanine in the second spraying (8-leaf)corn plant had the highest leaf area duration of treatment with the concentration ppm100. Which has a significant difference with other treatments. But there is no significant difference between the concentrations ppm150 and ppm50. The control treatment shows significant different from other treatments. According to the diagram (9), which corresponds to the tryptophan amino acid in the 6-4 leaf stage of growth, Maximum leaf area duration of treatment is ppm100 concentrations that are significantly different from other treatments. A notable point is that the first step sprayed has not show a significant difference between the control and treatment with concentrations ppm 50. The results of the diagram (10), the amino acid tryptophan in the 8-leaf stage the largest in leaf area has amino acids in concentration of ppm100. That it has a significant difference in Another treatments. Treatment does not have a significantly different in concentrations of 150 and ppm50. diagram (11) has been shown the interaction of amino acids 6-4 leaf stage as their combination. Spraying, compared to control for use each of them showed a significant difference, The most common related to the treatment shown with concentration of ppm 100 and amino acid tryptophan with PPm150 and phenylalanine concentrations PPm100. The results of the diagram (12) in the 8-leaf stage will show the interaction between any two amino acids. According to the results obtained in the experiments performed in the 6-4 leaf stage of corn increased of amino acid phenylalanine in 15% in comparison with control, durability leaf increased, but in the efficiency of the Step 8 reached over 20%. Although the amino acid tryptophan sprayed at 6-4 leaf has been associated with an increase of 20%. And Approximately had doubled increase in the 8 leaf.

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Table 2. Mean squares and significant levels of characters under examination

S.O.V	df	Leaf area index	Leaf area duration
Replication	2	15.92	22.09
Spray time(A)	1	15.18	24.97
Error(a)	2	0.66	1.11
Phenylalanine(B)	3	2.20	6.995
Tryptophan(C)	3	1.92	9.726
A×B	3	2.326	4.296
A×C	3	1.773	4.758
B×C	9	2.837	7.719
A×B×C	9	2.119	9.654
Error(b)	60	0.35	1.11
CV%		17	13.02

Significant In 1% and 5% level** &*

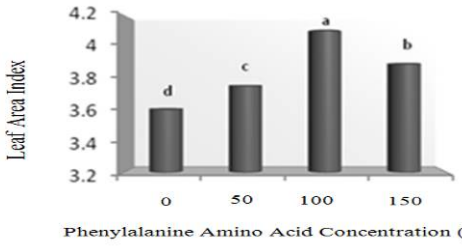

Fig.1. the main comparison of phenylalanine amino acid concentration in 4-6 leave stage on leaf area index

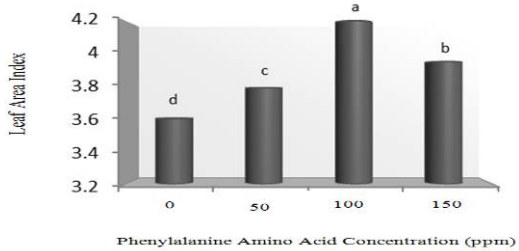

Fig.2. the main comparison of phenylalanine amino acid concentration in 8 leave stage on leaf area index

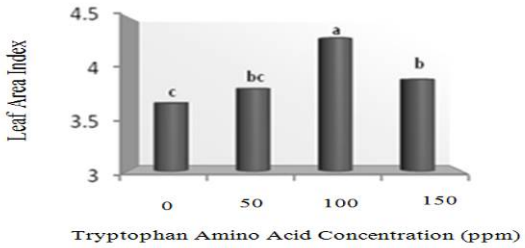

Fig.3. the main comparison of tryptophan amino acid concentration in 4-6 leave stage on leaf area index

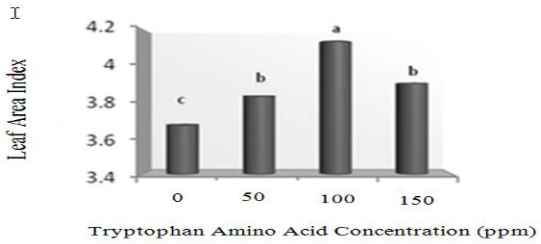

Fig.4. the main comparison of tryptophan amino acid concentration in 8 leave stage on leaf area index

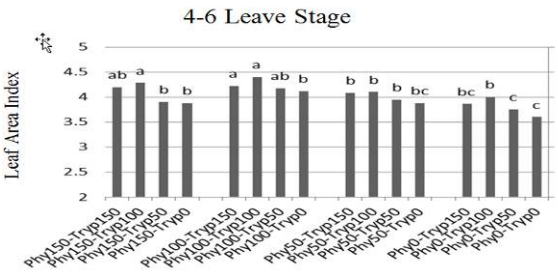

Fig.5. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 4-6 leave stage on leaf area index

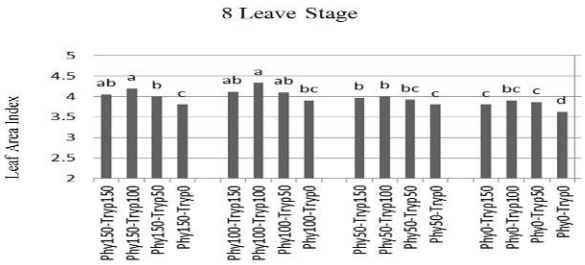

Fig.6. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 8 leave stage on leaf area index

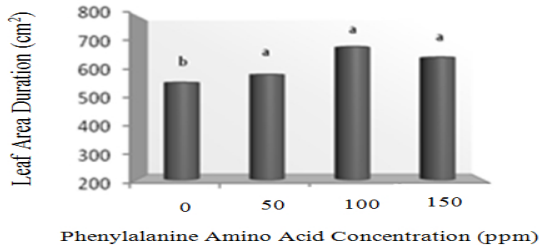

Fig.7. the main comparison of phenylalanine amino acid concentration in 4-6 leave stage on leaf area duration

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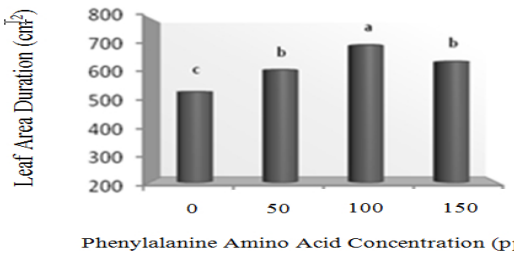

Fig.8. the main comparison of phenylalanine amino acid concentration in 8 leave stage on leaf area duration

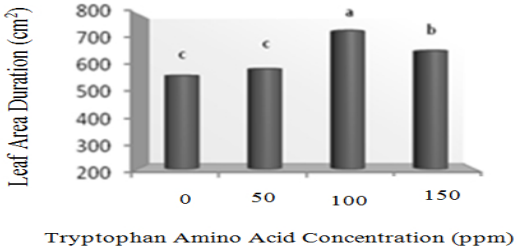

Fig.9. the main comparison of tryptophan amino acid concentration in 4-6 leave stage on leaf area duration

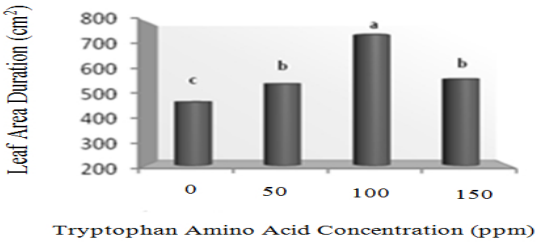

Fig.10. the main comparison of tryptophan amino acid concentration in 8 leave stage on leaf area duration

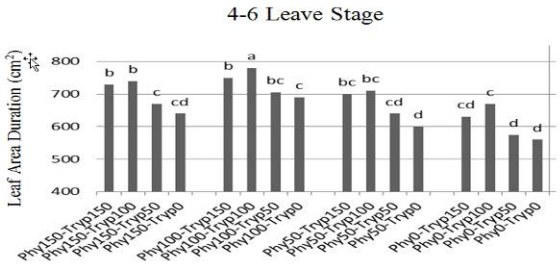

Fig.11. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 4-6 leave stage on leaf area duration

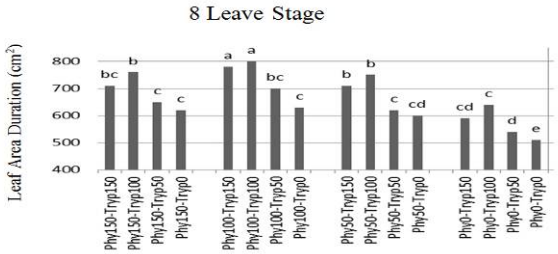

Fig.12. the main comparisons of interaction effects of tryptophan and phenylalanine amino acids by different concentrations in 8 leave stage on leaf area duration

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Applying the Knowledge of Operational Research in Agricultural Mechanization

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***Abstract*—**Applying any technologies that leads to increase productivity in the agricultural production is interpreted as mechanization. In another definition, the mechanization is the use of technology in agriculture in order to achieve stable development. If the latter definition is considered as the basis, it can be concluded that by using the scientific achievements which is considered as a type of technology and is accelerated the development of mechanical agriculture; steps have been taken to expand mechanization. One of these scientific achievements is the knowledge of Operational research. This knowledge which is one of the branches of applied mathematics is used to facilitate decision making based on scientific criteria and constraints. In the agricultural sector in which there are various restrictions such as weather conditions, economic and social issues; taking advantage of this knowledge can help to solve problems and make the right decision. This paper introduces knowledge of Operational research and its application context in agricultural mechanization.

***Keywords*—** Agriculture, Decision Making, Mechanization, Operational research

1. INTRODUCTION

The word technology does not have Persian route and is one of those words that has many applications in the Persian language. Nowadays this word, in Iran's industrial culture, is synonymous with production machines and expresses its technical characteristics. On closer examination also technology is introduced as a method of production. Technology is considered something beyond knowledge of production and its processes. Technology is a combination of knowledge, skills and technical abilities that enables its holder to change the natural world. Technology is an attitude comes from ability and experience; tools, machinery and hardware products, are the means of this attitude. Recently, due to the globalization of communication and information, current international economic and political conditions, accelerating global evolutions, technology is needed to overcome the problems more than ever. Therefore, each organization which can take more advantages of high-tech, will be more successful in the business. Agriculture, particularly the mechanization sect, is not an exception and always for its sublimity and improvement needs to apply the modern technological achievements. This paper introduces knowledge of Operational research and also discusses the feasibility of its application in the agricultural mechanization.

2. Definition of Mechanization

Agricultural mechanization is a collection of science and technology which includes the study and application of different types of machines and tools of driving force, in various stages of production and also in processing of agricultural products. In other words, applying technology to increase productivity in agriculture in compliance with all the aspects is mechanization. But there is another understanding which states applying any technologies that leads to increase productivity in the agricultural production is interpreted as mechanization. Mechanization is the use of technology in agriculture in order to achieve stable development. If the latter definition is considered as the basis, it can be concluded that by using the scientific achievements which is considered a type of technology and is also used in the development of mechanical agriculture, steps have been taken to expand mechanization. One of these scientific achievements is the knowledge of research in operation. This knowledge which is one of the branches of applied mathematics, is used to facilitate decision making based on scientific criteria and constraints. In the agricultural sector in which there are various restrictions such as weather conditions, economic and social issues; taking advantage of this knowledge can help to solve problems and make the right decision.

3. Overview of Operational research

Operational research is the application of a scientific approach to solving management problems, and seeks to help managers to make better decisions. Operational research focuses on a set of mathematical techniques that are either have been developed in the field of "Management science" or have been derived from the other natural sciences,

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mathematics, statistics and engineering. Although Operational research is a new type of science, it is very well known and established in industry and business. Applications of this science are very broad and its commonly application in industrial and commercial establishments clearly demonstrate authenticity of it. Many studies have been conducted on the application of Operational research techniques. It has been found that the results of applying this procedure is very satisfactory. So, today this science in many disciplines is taught as a compulsory subject and also in many universities is taught in the form of an independent discipline. Operational research is usually expressed in such titles as; Management science of quantitative methods, Quantitative Analysis and decision making science. In many texts (including this paper) rather than "Operational research" the short term OR is used.

3.1. The Emergence of Operational research

Operational research is developed and expanded during World War II by English scientists. At that time, the British military administration employed a group of scientists- those who were expert in tactical and strategic issues related to air and ground defense- to research in this field. The main reason for these studies was the shortage of military budget and resources. Thus, the study of how to make good and maximize use of military system resources was necessary. As it is understood from the title Operational research, it was because of the nature of team's research on military operations. The name "Operational research" or "research in the operation" or simply "OR" is widely used recently for a new way of scientific and systematic study of operations. After the war, the military groups' success drew the attention of industrial managers. Managers seek alternatives for their problems which were caused by the arrival of job specialization in business that got worse day after the day. Despite the fact that originally specialized jobs are created to serve the overall objectives of an organization, individual goals of these jobs may not always be consistent with the objectives of the organization. This situation has led to a complex decision making problems that eventually forced the organizations to seek the most effective ways to use OR. In 1947 George Dantzig devised the simplex method to solve problems of Linear Programming which was the first and most important achievements of this research. Some of the conventional means of Operational research, such as dynamic programming, queuing theory and theory of inventories up to 1950 were relatively advanced. Effective progress in the field of Operational research largely was due to the simultaneous development of the computers, which has computational speed and supernatural ability to store and recall information. In fact, if computers were not invented, Operational research, with large-scale computational problems, has not achieved the present promising position in various fields of business.

3.2. Definition of Operational research

Operational research based on different users has different definitions. Depending on the application of this science in different organizations by different users, the most important definitions of OR are as follows:

1. Operational research is a set of scientific methods and techniques to identify problems within the system and is used to seek the ideal alternatives for the issues.
2. Operational research is the application of scientific methods to study complex activities and operations of large organizations.

Perhaps the most important definition for the OR is expressed as: the application of scientific method to analyze and solve problems of management decision making. What is more than anything represents the OR is its features that will be discussed in later sections.

3.3. Decision Making: The Focus of OR

A decision is the result of the selection process of a better option between two or more different options that helps to achieve the objectives. This process is called decision making. According to Herbert Simon, decision making is synonymous with the entire management process. To illustrate the significance of decision making, look at other management tasks such as planning. In the definition of Planning, it has been said that planning consists of a collection of decisions, such as what should be done? How? Where? By whom?

Clearly, planning refers to decision making; (the other management tasks as well as a combination of organization and control decisions are reviewed.)

In the Operational research, the decision making issues are addressed in a systematic process. This process has the following steps:

1. Defining the problem
2. Identifying possible alternatives
3. Evaluation of possible alternatives
4. Select alternatives

The decision making is one of the duties of directors to resolve the problem or issue. So, if the problem does not occur, the decision does not need to be made by managers. Each problem has dimensions and definitions that should be expressed well-versed. After defining the problem, the possible alternatives for the problem are identified. By testing known alternatives, the best alternative is chosen by the director.

3.4. Models in OR

Using the models, especially mathematical models, is the basis of the OR. Model is a simplified or abstraction of reality.

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Models are usually simple version of reality; because often the reality of case has lots of complexity. Reflecting the complexity of problems in all aspects is very difficult and often impossible. Properties "simplification" and "abstract" in the OR models make it difficult in order to achieve the real goal. In other words, a simple model cannot express the actual status of the problem.

3.5. The Application of Computers in the OR

Incredible advances of computers, is one of the key factors in the rapid progress of the OR. The complex and difficult issues which often OR dealing with, require a lot of calculations. Often do these operations manually is not possible. As a result, the computational capability of computers which is millions of times faster than manual methods, results in an extraordinary rapid progress in this science.

The progression of computer has paved the way to solve complex problems in the OR. Although only a few software were released in 1984, already it has been said that the underlying number of efficient software of OR is over 100. Growing OR software has caused OR techniques from theory become closer to practice and their scope is stretched more to businesses and industries more than before.

3.6. Operational research Approach to Problem Solving

The main feature of OR techniques and its emphasis is on systematic and logical approach to problem solving. It is through these techniques that its features are introduced as "scientific method".

3.6.1. Observation

The first step in the process of Operational research is to define the existing problem in the system or organization. Each system is constantly exposed to the problems that prevent the system from reaching its goals. Director must have some experts to observe the personnel and their relationships in order to achieve organizational pathology and problem's definition.

3.6.2. Defining the Problem

When it becomes clear that the problem exists, it must be carefully and clearly defined. Inaccurate and unclear definition of the problem could lead to the wrong answer. So the accuracy of defining the problem and the degree to which the problem can affect the performance of organization, is necessary to define.

3.6.3. Build a Model

Model in Operational research is a summarized expression of problem in the real world or organization. The model can be expressed in the form of a figure or graph. But often in the OR, the model consists of a set of mathematical terms. Mathematical terms of model in OR contains numbers and symbols. For example, suppose a commercial institute wants to sell goods. The production cost is 5 riyals and the selling price is 20 riyals. The model which expresses the total profit from the sale of goods, is:

Z-20X-5X

In this equation, X represents the number of sold products. And Z is the total profit from the trade. Symbols X and Z are read variable. It is clear that there is no pre-defined values for the X and Z, and it is the reason why the term variable is used. The number of sold units X and the total earnings Z can take any amounts in pre-defined domain; in other words, they can change. These two variables are completely separated. Variable Z is a dependent one; due its value dependency on the number of sold units. Variable X is an independent one; because the number of sold units in this equation does not depend on anything else. An equation in its general case is known as a functional relationship. Equation is also called relationship. The term is derived from the fact that the profit of Z, is a function of the number of sold units in X, and this equation, attributes the profit to the sold units.

Suppose now that the product is made of Iron and the institute has 100 kg. To produce each unit of product X, 4 kg of Iron is necessary. A new formula for the expression of the Iron product defined as follows:

$$100 = 4X \text{ Kg} \qquad (١)$$

Equation expresses the fact that every single product will consume 4 kg from 100 kg available Iron. Thus, the model consists of two equations as follows:

$$Z = 20X\text{-}5X \qquad (٢)$$
$$4X = 100$$

The profit equation in the above-mentioned model is called objective function. The term of consumption of goods from Iron is said a restriction. In other words, the institute is trying to maximize its profit as much as possible, and increase its profit as much as Iron availability allows. The increase in profit is limited to available resources (100 kg Iron). According to the expressed concepts, the two above-mentioned equations can be stated as follows:

$$\text{Maximize } Z = 20X\text{-}5X \qquad (3)$$
$$\text{Subject To:}$$
$$4X = 100$$

The above model is translated as follows:

$$Z = 20Z\text{-}5X \text{ maximize} \qquad (4)$$

Provided that:

$$4X = 100 \qquad (5)$$

From now on, for writing models, instead of English words, the following summary is used:

$$\text{Max } Z = 20X\text{-}5X \qquad (6)$$

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Subject To:
$4x = 100$

This model represents a management problem that is going to determine the number of production of its institute. So the variable X, expresses the potential decision of the directors. So X is known as the decision variable. After completing the model, it must be revised to check if it is indicative of the operating system. Administrator shall ensure that the built model, is to represent the actual behavior of the system.

3.6.4. Solving Model

The problem which is formulated in the OR form, must be resolved by the OR model-based and techniques. Each of Operational research techniques are used to solve a particular model, so this type of model and its solving technique are two distinct parts in the OR. It simply can be distinguished whether the built model would be solvable or not. Given that the model represents the problem, then it means solving the problem is of manager's interest.

3.6.5. Implementation Results

Problem-solving techniques in the OR provide information that will assist managers in better decision making. The manager should not use the results of the model without considering deep thinking. In the final decision making, managers need to combine information obtained from solving the model and with their experiences and consultants. If the administrator does not apply data obtained from the OR techniques, he should actually forget about all the steps in the OR scientific process. Scientific study will be valuable as soon as it will be carried. The actual value of scientific study process and its impact on system performance will be studied.

3.6.6. Repeatable Nature of OR Process

The completion of the OR Quintet steps of the process does not necessarily mean the process is completed. Maybe in every step of modeling, solving and implementing the necessity of revision is aroused. For example, in many cases, during the production of the model, new aspects of the problem may be recognized or that the resolution of the model and its implementation need to change their structure and define the case again. So at each step, getting feedback is required. Also the new information obtained from the environment and the future of the organization may affect the entire structure of the case and the model.

3.7. Operational research Applications in mechanization

3.7.1. Determining the Optimal Index Level of Mechanization

For the assessment of mechanization condition, indicators such as the level, Degree and capacity of mechanization are used. Of these indexes in different regions are different, depending on climatic conditions, soil texture and product type. Therefore, the plan for achieving stable development must be done, based on the desirable level of these indicators. In Operational research science, by modeling of the real situations and considering the limitations, the optimal index level of mechanization can be determine And on this basis, the next steps of planning and implementing development projects of mechanization should be taken.

3.7.2 Determining the Best Combination of Power Sources and Available Machines

Sometimes diversity in agricultural machinery market is to the extent that the decision about choosing a machine is difficult for farmers. Despite the factors such as technical issues, Price, machine's brand, the amount of credibility among consumers, regional adaptation and after-sales service makes, choosing a machine is not an easy task. On the other hand, in many cases, the aim is not merely buying an agricultural machine. But in cases where the farmer wants a set of devices (from tillage to harvest) and resources that can be purchased from a technical point to be matched, the complexity of the selection process will be added. By using science of Operational research and linear programming, and also quantifying these factors, the optimal combination of desired machines can be prepared and based on it, the machine was purchased or leased.

3.7.3. Planning for Mechanized Operations Due to Farming Calendar

In agriculture, unlike industry, activities are done in certain periods of the year. Due to time constraints in implementation, it is required prior to the provision of machinery to be seen in terms of quality and quantity of work has done at the proper time. The weather conditions may reduce the number of available days. Science of Operational research, raising the possibility of studying influential parameters (parameters such as time, the economic and technical issues which are contributing to machinery operations) by presenting a linear programming problem. After considering all these issues, the best plan for operation of mechanized farming units is offered.

3.7.4. Planning Repairing and Maintenance Operations of Machinery

Technical health and standby of agricultural machinery in the season, is one of the machinery principal tasks. Achieving this goal depends on the accurate and regular maintenance and repairing tasks. Operational research provides conditions under which with regard to technical, economic and time parameters, a regular and thorough

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maintenance and repairing process is planned in a way that, it has the lowest time and cost and best quality.

3.7.5. Planning to Buy a New Machines and Replacement

Lifetime of an agricultural machine depends on working hours, mode of operation of the device, and the arrivals of the new technologies to the market. The responsibility of machinery principal is to attempt to do replacement and modernization before spending more of their income on each of machines. Factors such as income, cost and technical issues can be imported into the economic model by economic modeling which is a part of Operational research science; and also the best time can be determined to replace the machines.

3.7.6. Reduction of Mechanized Unit Costs

Starting and maintaining a business depends on its productivity. Profit comes from a simple but very practical equation which is the difference between the income and cost. By identifying sources of cost and also financial management, costs can be reduced and profits increased. The objective of application of science of Operational research, particularly in economic issues, is maximizing the positive factors such as income and minimizing the undesirable factors such as the cost. On the other hand, one of the reasons that mechanization is lagging behind in many parts of the world, is its cost, in a way that farmers will earn more profits by means of traditional agricultural activities. By using knowledge of Operational research and creation of an economic model for mechanized agriculture, an appropriate planning action can be taken in order to optimal use of the production, especially the machinery. In this way, the economic costs of mechanization can be reduced, and it is a great step in the development of mechanization.

CONCLUSION

Over time, the definition of agricultural mechanization has changed. Once, only using the tools and machinery, was considered as an indicator of mechanization. But now, paying more attention to other aspects such as management and software are considered as an important part of the development of mechanization. Knowledge of Operational research in comparison to the other sciences is new, but according to its ability, succeeded to find its place shortly among other industries; so that today this knowledge is used as an indicator of modernization for a commercial unit. The main advantage of this knowledge is that where many variables and constraints are involved in decision making, with the benefit of Mathematics and Modeling, it shows the optimal which facilitates decision making and reduces risk of an economic activity. Agricultural mechanization that also subjects to various factors such as technical, economic and social issues, needs the powerful device such as research operations to help managers in their strategic planning.

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Biography: My name is Ahmad Reza Maleki. I was born in Ahvaz, Khuzestan, Iran on September 11, 1984. When I was 18 years old, I took and passed university entrance exam and enrolled for Agricultural Machinery Engineering in Shahid Chamran University of Ahvaz. After four years, I got my bachelor in Agricultural Machinery (2002-2006). Then I started master in Agricultural Mechanization in Islamic Azad University, in 2007, and graduated in 2010. I was employed in ministry of agriculture as an agricultural mechanization expert (2012 till now). At the first year of my new job, I got several encouragement letters for my considerable abilities and one of them was from crop production deputy of minister of agriculture. So, the managers of Khuzestan agricultural organization decided to assign me more responsibilities. Beside the work, I have lots of research activities and these efforts led to several scientific articles. I have also valuable computer skills. I have more than ten years of experience in working with Microsoft Windows operating system. I can also work proficiently with software like, Microsoft Office Word, Excel and PowerPoint. Additionally, I have International Computer Driving License certification (ICDL). I decide for further education in agricultural mechanization, but maybe not in near future.

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The indiscriminate use of fertilizers containing of lead in soils of southern Kerman, Iran

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Abstract-
soil contamination by heavy metals is one of the most serious environmental problems. in this study the lead metal concentrations were studied in soil southern Kerman province, Iran. For this aim, three samples soil were selected from study area, and from each region 10 soil samples were taken from 0-30 cm of depth. samples were mixed together, and then one sample was sent to the lab combined. After extraction, to measure lead concentration was used of atomic absorption spectrometer. The results show that the risk of lead contamination was more in the city of Jiroft that can be the soil characteristics.

***Keywords*— Soil contamination, heavy metals, lead, Soil properties**

INTRODUCTION:

Soil is the basis of existence, production and storage of raw materials and plays an important role in human life. the soil is more important than the weather. Soil conservation as a function of environmental policy such climate is essential to man, the more he tries to clean air and water, as well as a result of their action cleanser, more contaminated soil and the soil pollution is added to. Any change in the properties of the components of the soil so called soil pollution will be impossible to use it. Soil, source of income and production and is based all materialistic civilization. changes in characteristics of the components of the environment so that the natural function and balance its biological be affected and directly or indirectly prejudicial to the interests of living organisms according to the, environmental pollution. Soil contamination is usually the result of unhealthy habits, agricultural activities and for incorrect methods of disposal of solid and liquid wastes. In addition, air pollution causes loss of soil pollution in precipitation could be useful, carelessness of the soil heavily with chemicals such as heavy metals and oil products were contaminated and of through the food chain, surface water or groundwater getting into the body of man. Levels of pollution - can be classified according to disease severity between 1 to 6 [2].

Table1:Classificationof contamination factor values

Factor Value	Degree of Pollution
0	No pollution
1	No pollution, moderate pollution
2	moderate pollution
3	Moderate to strong pollution
4	Strong pollution
5	Strong to very strong pollution
6	Very strong pollution

Excessive use of agricultural pesticides and fertilizers, antibiotics and hormones in livestock and irrigation with contaminated wastewater are from agricultural factors affecting soil contamination. Cancer, neurological and respiratory diseases and skin is long term effects of pesticides on humans. Lead the automotive and battery consumption is also added to gasoline to boost the performance¬. Some pesticides plant is the lead content requirements. Unfortunately, the lead-contaminated air and then transferred to the soil by rain ments. Limit the use of lead in human solid food should not exceed 600 micrograms per day. Humans absorbed through inhalation of 10 to 100 mg and fed up to about 300 g daily. Lead capture plant diversity was not clear and the after absorption, of lead replacement plants are bad things. Lead biologically non-essential elements that are very dangerous for human health and for the growth and photosynthesis has a negative effect [4]،[14],[17]. Lead concentrations in soil is between 1-20 mg and and averages 15 mg kg^{-1} and can be critical level of 50 mg kg^{-1}. Lead the different ways is transferred including mining, metallurgical industries, fossil fuel use, sewage sludge, fertilizers and

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pesticides-pesticides to soil [5]،[11],[16]. Some also through chemical fertilizer, mining, materials and plant, car charger, mains water pipe corrosion in the city of white used or dissolving ceramic glazes chain human food and livestock is . Lead in soil can be more of a Pb^{2+}. Lead contamination is usually of the soil surface is usually in layer [15]. And only a small amount of lead soil, is in the soil solution phase [8]،[13]. The toxic effects of lead on the plant can pointed to tissues leaves change color to dark mode, older leaves wither, the growth of short-stay foliage and roots of coffee. In relation to the High concentration of lead in the human body noted to fatigue, muscle contraction, neurological abnormalities and anemia. Several studies have concluded that there are a quantitative relationship between the amount of lead in dust and blood children [3]. Among the most toxic heavy metals, chromium and lead in some industrial wastewater are, which sometimes can be entered directly into the soil. Lead solubility is less than chrome And strongly is absorbed by soil composition . Outside sources of lead in the soil is, fossil fuel, smelting and mining operations, mining and road runoff [9]. Lead is formed carbonate sediments, phosphates, sulfates soil [7]. Deposition of lead carbonate in calcareous soils than non-calcareous soils are common[10]. Park and colleagues [12], showed that the formation of precipitates such as lead, lead carbonate, lead chloride, lead chloride hydroxide reacts with lead, manganese and aluminum hydroxides in aqueous solution has two layers.

Materials and Methods:

Three soil samples were chosen of arid southern Kerman (Jiroft, Kahnooj and faryab), with warm, dry weather. soil samples were taken from the profiles 0-30 cm. Then samples from each location to the mix and finally a composite sample was transferred to the laboratory and passed through a sieve 2-millimeter. soil physical and chemical properties such as soil texture and soil pH by hydrometer method, pH and conductivity meters, conductivity meter and Pb by atomic absorption spectrometry Abrvzyshn and phosphorus measured using Alson and respectively. And 200 g of each soil in plastic pots dumped and stored in the laboratory at a temperature of 2 ± 25 ° C is. irrigation with distilled water to reach field capacity was carried out in the field. After months of keeping a vase The soil was sampled. One gram of soil in man Pyryks containing 20 mL solution of Pb(10,30,60,120,240 mg) and a solution of calcium chloride to prevent the normal activity of the microorganisms were added and a few drops of toluene were added to the solution. And 24 hours at a temperature of 2 ± 25°C, Shaker said. Whatman filter paper samples with Shaker after 42 extracted and centrifuged, and the concentration of lead by atomic absorption Abrvzyshn was measured. In a factorial completely randomized design with three replications.

Results and Discussion:

Chemical and physical properties of soils studied and the lead concentration in the soil is shown in Table 2 and 3. And Come. a bar graph in Figure 1, the concentration of lead.

Table 1:Physical and chemical properties of soils studied

Ec(ds/m)	P(mg/kg)	$CaCo_3$ (%)	Clay (%)	pH	city
0.518	0.00435	9	28.5	8.43	faryab
0.173	0.00565	10.5	22.5	8.94	kahnooj
0.126	0.00585	5.5	18	7.68	jiroft

Table 3: The amount lead of fertilizer

Pb(mg/l)	Fertilizer rates lead(mg/ha)	city
1.99	400 1200	faryab
11.68		
2.35		kahnooj
13.98		
2.59		jiroft
15.69		

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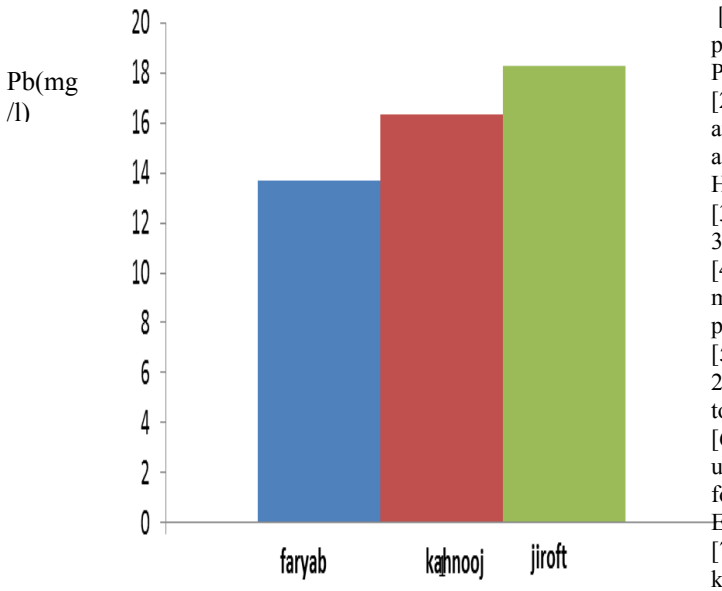

Conclusions and recommendations:

Soil through various activities man of mining, metallurgical industry, chemical fertilizer use and application of sewage sludge on agricultural land are contaminated with heavy metals. As shown in the table, the minimum average lead concentration in the irrigated area, and the maximum concentration was in Jiroft. when the fertilizer rate of 400 kg ha -lead, Pb 1.99 mg and the amount of irrigated area of 1200 kg lead manure on irrigated acres were added to the soil, the concentration was changed around 11/68. But in Jiroft when fertilizer rate of 400 kg ha^{-1}-lead, Pb concentrations of 2.59 and 1200 kg ha^{-1} pollutant concentrations increased by approximately 15/69. In fact, the increase in soil lead desired fertilizers, soil Pb solubility of lead in soil Jiroft is more than words, and this is referred to as soil characteristics. As a result, the concentration of Pb is manure leaching increases and eventually can cause further contamination of underground water, is. And due to high levels of lead contamination in the city of Jiroft , the risk of lead poisoning and pollution to human and plant life in this area than other parts will threaten. And trying to resolve these problems is indispensable. The results showed that most of the contamination factor in - class samples without contamination from pollution are moderate. In other words, it is a factor of 0-1. The heavy metals are found naturally in the soil and agricultural activities, the use of chemical fertilizers leads to further accumulation of these metals in the soil. In other words, the complexity of soil and contaminants-many of them make the most of remedial activities is difficult and costly.

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