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RESPONSE OF SOME SOYBEAN CULTIVARS TO ORGANIC AND MINERAL FERTILIZATION

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ABSTRACT

Two field experiments were conducted at private farms in El-Semblawin, Dakahlia Governorate during 2005 and 2006 seasons to investigate the effect of cultivars (Giza 111, Crawford, Giza 35 and Giza 21) and fertilization treatments (farmyard, chicken, urea, 75% farmyard + 25% urea and 75% chicken + 25% urea) on growth, yield and yield components as well as seed oil and protein contents. A spilt plot design with four replications was used. The obtained results can be summarized as follows:

1- Plants of Crawford were taller than the other cultivars (Giza 21, Giza 35 and Giza 111) in both seasons. While Giza 21 gave the highest number of branches, number of flowering groups and number of pods per plant, number of seeds/pod, number of seeds/plant, seed weight/plant, 100-seed weight, seed yield (ton fed) and oil and protein contents. While, Crowford gave the highest straw yield (ton/fed). However, Giza 111 gave the highest stem diameter as compared to the other cultivars.
2- Application of 75% chicken + 25% urea significantly increased all the studied characters of soybean cultivars in both seasons.
3- The interaction between Crawford and 75% chicken + 25% urea in both seasons had a significant effect on plant height and straw yields (ton/fed).
4- The interaction between Giza 21 and fertilization with 75% chicken + 25% urea gave the highest number of branches and oil content in the first season only.
5- The interaction between Giza 21 and fertilization with 75% chicken + 25% urea gave the highest values of number of flowering groups per plant, number of branches per plant, number of pods/plant, seeds weight/plant, 100-seed weight and seed yield (ton/fed) as well as oil and protein % of soybean seeds.

INTRODUCTION

Soybean (*Glycine max*, L.) is an important oil crop in the world. In Egypt, many attempts have made to maximize total production to bridge the gab between local production and consumption from edible vegetable oils by improving cultivation of soybeans. In this respect, Mohamad (1994) found that L. 21 genotype was superior to all genotypes in plant height, pods number per plant, seed yield per plant and 100-seed weight as well as seed and straw yields per feddan. Abd-Alla and Omran (2002) recorded that soybean cultivars had wide range of variation in growth and yield as well as its attributes, also varietal differences were detected among soybean cultivars in hast efficiency and to soybean nematodes. Husein *et al*. (2006) found that soybean, Giza 21 cv. surpassed Giza 22 and Giza 111in 100-seed weight (g) and seed yield (ton/ha) by 64 and 15% in the first season and 26 and 12.8% in the second season, respectively.

With respect to the effect of fertilization treatments, Wandile *et al*. (2005) found that the highest yield of soybean was recorded with the application of 7.5 t Fym/ha. Moreover, Wandhekar *et al*. (2005) found that the seed yield and straw yield of soybean increased with use 5 ton Fym/ha. Sabale (2005) stated that the application of 50 kg N/ha urea, Farmyard manure, compost and vermin compost in different combinations increased number of pods plant, weight of seed per pods, 100-seed weight and seed yield soybean. Also, Kanase *et al*. (2006) found that plant height, number of branches/ plant, number of pods/ plant, weight of seed/ plant, seed yield/ha and straw yield/ha increased with application 25-50% and 50-75% Fym. Moreover, Paradkar and Deshmukh (2004) found that 10 t/ha Fym gave the tallest plants and highest number of branches/ plant, number of pods/ plant, 100-seed weight and seed yield of soybean. Fayed *et al*. (1986) found that increasing nitrogen rates caused significant increases in number of seeds/ plant and protein and oil content of seeds for three different soybean cultivars (Calland, Mitehll and Davis). Singh and Rai (2004) stated that the highest number of pods/ plant and seed pod, 100-seed weight of soybean and protein content was with using 5 t/ha Fym.

MATERIALS AND METHODS

Two field experiments were conducted at special farms in El-Semblawin, Dakahlia Governorate during 2005 and 2006 seasons to investigate the performance of four cultivars (Giza 111, Crawford, Giza 35 and Giza 21) under five fertilization treatments (farmyard, chicken, urea, 75% farmyard + 25% urea and 75% chicken + 25% urea). The experimental design was spilt plot with four replicates. The main plots were devoted to cultivars (Giza 111, Crawford, Giza 35 and Giza 21), while the sub plots were assigned to five fertilization treatments (farmyard, chicken, urea, 75% farmyard + 25% urea and 75% chicken + 25% urea)**.** Sown date was at 10^{th} and 12^{th} of May for 2005 and 2006 seasons, respectively. Before planting, 200kg calcium superphosphate (15.5% P_2O_5) per feddan was applied after ridging. The experimental unit area included 5 ridges, of 60 cm apart and 3.5 cm length comprising an area of 10.5 m^2 (1/400 fed).

Soybean seeds were planted in hill spaced 20 cm on the two sides of the ridge, producing 140000 plants/ feddan. Each hill received 2 seeds to secure the appropriate number of plants. The preceding winter crop was berseem (*Trifoliem alexandrinum,* L.) in the first and second seasons.

Soil samples were taken to measure the important chemical and physical soil properties (Table, 1). Plots were hoed twice, before the first and second irrigations. The plants were thinned to two plants per hill before the first irrigation. Fertilization treatments were added at two equal doses prior to the first and second irrigations.

The normal agricultural practices were undertaken as prevailing in the region during the four soybean cultivars growing season. The first irrigation was applied after 21 days from planting and the following irrigations were applied at 15 day intervals.

Table 1: Mechanical and chemical analysis of the experimental soil.

Analysis	Season	
	2005	2006
Mechanical (%)		
Soil fractions	3.10	3.20
Fine sand	15.90	15.70
Silt	36.00	36.10
Clay	45.00	45.00
Chemical analysis		
Organic matter (%)	2.77	2.78
Available nitrogen (ppm)	86.00	88.00
Available phosphorus (ppm)	56.00	57.00
Exchangable potassium (ppm)	142.00	145.00
pH	8.4	8.5

Plots were hoed twice, before the first and second irrigations. The plants were thinned to two plants per hill before the first irrigation.

Number of harvested plants and ears for each plot were recorded at harvesting time *i.e*., 13th and 15th September in 2005 and 2006 seasons, respectively. At the end of cultivation period (maturity) the following characters were studied:

1- Plant height (cm).
2- Number of branches/plant.
3- Stem diameter (cm).
4- Number of groups flowering/plant.
5- Number of pods / plant.
6- Number of seeds / pod.
7- Number of seeds / plant.
8- Weight of 100-seed (g).
9- Seed yield (ton/feddan).
10- Straw yield (ton/feddan).
11- Oil and protein percentages of seeds (according to A.O.A.C., 1984).

Statistical analysis:

All data were subjected to statistical analysis by the technique of analysis of variance of the split plot design. The treatment means were compared at 5% level of probability using the least significant difference (NLSD) method as mentioned by Waller and Duncan (1969).

RESULTS AND DISCUSSION

A- Cultivars performance:

Data collected in Tables 2 and 3 show the effect of cultivars on growth, yield and yield components of soybean. In both seasons of study, there was a significant difference among the four cultivars, at the time of harvesting, plants of Crawford were taller and gave the highest straw yield than the other cultivars (Giza111, Giza35 and Giza21). However, Giza21 cultivar had lower stem diameter as compared with that of Giza111, Crawford

and Giza35. It was obvious (in 2005 and 2006 seasons) that Giza21 had highest number of branches/plant (4 in 2005 season only), number of flowering groups/ plant (25.79 and 26), number of pods /plant (68.82 and 70.4), number of seeds/ pods (2.7 in 2005 season only), number of seeds / plant (179.79 and 194.03), seed weight /plant (21.13 g in 2005 season only), 100-seed weight (17.76 and 18.64 g), seed yield (1.744 and 1.603 ton/fed), oil (22.35% and 20.15) and protein (33.17 and 35.13 %) as compared with the other tested cultivars.

Such differences among tested cultivars may be attributed to their genetic constitution, which may be manifested in lower number and shorter internodes. Also, may be attributed to the fact that the denser plant population the more competition exists among plant for light resulting in more growth in height through the elongation internodes. These results are in accordance with those reported by Mohamed (1994), Abd-Alla and Omran (2002) and Husein *et al*. (2006).

B- Fertilization treatments effect:

Data in Tables 2 and 3 also, reveal that there was a significant differences in the studied characters of soybean with the application of different fertilization treatments in both seasons.

Table 2: Means of plant height, number of branches/plant, Stem diameter (cm), No. of flowering groups and pods/ plant and No. of seeds / pod as affected by different cultivars performance and fertilization treatments in 2005 and 2006 seasons.

Characters / Treatments	Plant height (cm)		No. of Branches /plant		Stem diameter (cm)		Flowering groups/ plant		No. of pods / plant		No. of seeds / pod	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Cultivars												
Giza 111	73.56	82.13	3.67	3.23	0.82	0.84	22.50	23.10	63.29	63.60	2..54	2.75
Crawford	77.76	84.50	3.76	3.35	0.80	0.77	23.27	24.10	58.84	58.75	2.54	2.78
Giza 35	70.11	76.92	3.86	3.50	0.81	0.76	25.08	24.05	57.51	61.50	2.59	2.84
Giza 21	69.58	78.37	4.00	3.50	0.76	0.72	25.79	26.00	68.82	70.40	2.70	2.87
F. test	*	*	*	NS	*	NS	*	*	*	*	*	NS
N.LSD at 5%	1.77	1.87	0.14	-	0.20	-	0.76	1.05	2.23	1.28	0.10	-
Fertilization												
Farmyard (Fym)	68.36	76.79	3.29	3.13	0.73	0.68	21.57	21.19	52.96	56.88	2.68	2.43
Chicken (Ch.)	68.69	76.31	3.49	3.25	0.78	0.73	23.36	23.13	58.54	57.69	2.71	2.55
Urea	76.44	83.06	3.79	3.19	0.83	0.81	24.99	25.63	65.34	66.88	2.87	2.70
75% Fym + 25%Urea	71.11	82.88	4.19	3.50	0.82	0.78	23.44	25.69	61.76	66.44	2.75	2.57
75% Ch. + 25%Urea	78.63	83.35	4.33	3.78	0.83	0.87	27.42	25.94	71.98	69.94	3.03	2.71
F. test	*	*	*	*	*	*	*	*	*	*	*	*
NLSD at 5%	1.59	1.81	0.15	0.33	0.02	0.08	0.77	0.97	2.83	1.78	0.10	0.10
Interaction												
F. test	*	*	*	NS	NS	NS	*	*	*	*	NS	NS
NLSD at 5%	3.31	3.76	0.32	-	-	-	1.54	2.02	6.53	3.69	-	-

The application of 75% ch.+ 25% urea showed significant increase in plant height, number of branches/plant, stem diameter/plant, number of flowering groups/ plant, number of pods/plant, number of seeds/pod, number of seeds / plant, seeds weight /plant (g), 100-seed weight, seed and straw yields (ton/fed), oil% and protein % in both seasons.

The observed increase in the tested soybean characters may be attributed to the fact that nitrogen is essential for protein synthesis and building up the protoplasm, which may lead to better growth and taller plants. More, these increases may be due to the role of nitrogen in prolongation the vegetative period resulting increases of the metabolic process within the plants through their direct effects on the photosynthesis and on the enzymatic reaction. These results are in good agreement with those reported by Wandhekar *et al*. (2005) and Kanase *et al*. (2006).

C- Effect of interaction

The interaction between cultivars and fertilization treatments in both seasons had a significant effect on most of the tested characters in both season as shown in Tables 4 to 7. The interaction between Crawford and 75% Chicken + 25% Urea in both seasons had a significant effect on plant height (Table 4). All possible interaction had a significant effect on number of pods per plant, number of seeds per pod, number of seeds per plant, weight of seeds per plant weight of 100-seed and seed yield in favor of different varieties with fertilization treatments (Tables 5 and 6).

A significant effect of the interaction between cultivars and fertilization treatments on means of number of flowering groups per plant, number of pods/plant, number of seeds / plant, seed weight/plant, 100-seed weight, seed yield (ton/fed) and protein % of soybean seeds was observed in both seasons as shown in Tables 4 to 7 the highest values was recorded by the combination between Giza 21 and 75% chicken + 25% urea.

The interaction between Giza 21 and 75% Chicken + 25% Urea also, significantly increased the content of oil in 2006 season. Whereas, the same interaction significantly increased most of characters and protein content of soybean seeds in both seasons (Tables 4 to 7). Similar results were reported by Eweida *et al*. (1997) and Panneersel and Lourdural (2000).

It is obvious that fertilization treatments resulted in a beneficial effect on the general vegetative growth which stimulates the production of more photosynthates and consequently in creased yield of seed. Moreover, N affected favorably the correlated characters, namely, the average number of pods/ plant, number of seed / pod, number of seed/ plant, 100-seed weight. Yield increases recorded on higher nitrogen dose could be attributed to the role of nitrogen in the different metabolic activities in the plant. Nitrogen addition prolonged the vegetative period resulting in delayed flowering and increasing the fruiting zone by increasing plant height. These results are in harmony with those obtained by many authors including Singh *et al*. (1995), Ramamuth and Shivashankar (1996) and Aiok *et al.* (1997).

3+4

5+6

Finally, under Dakahlia governorate conditions, cultivation of soybean cultivar; Giza 21 and fertilization with a mixture of chicken manure (75%) and mineral nitrogen (25% Urea) is highly recommended. Where, the highest growth characteristics, yield and its components and quality of soybean seeds (Giza 21) recorded the highest values during the course of this investigation when applying 75% Chicken + 25% Urea. Moreover, this kind of fertilization (chicken manure) is environmental friendly and coast effective.

Table 7: Means of oil and protein % as affected by the interaction between cultivars and fertilization treatments in 2005 and 2006 seasons.

Treatment	Oil percent in soybean seeds				Protein percent in soybean seeds							
	2006				2005				2006			
	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21
Fym	17.75	17.75	18.15	18.75	30.95	31.04	31.02	30.98	31.58	31.67	31.64	31.59
Ch.	18.25	18.50	18.75	18.75	30.96	31.04	31.14	31.12	31.75	31.58	31.84	31.63
Urea	19.50	19.75	20.75	19.50	37.2	37.27	37.46	37.28	36.99	37.71	37.53	37.42
75%Fym+25%U	19.25	19.25	20.00	19.50	31.03	30.95	31.06	31.05	31.60	32.23	36.45	33.13
75%Ch.+25%U	21.50	20.75	21.50	24.50	37.31	34.45	37.33	38.13	36.48	37.50	38.19	39.08
F. test	*				*				*			
NLSD at 5%	0.88				0.89				0.49			

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استجابة بعض أصناف فول الصويا للتسميد العضوي والمعدني

سمير السيد القلا ، عادل محمد سلامة ، على السعيد شريف و الشيماء السيد إبراهيم مصطفى
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أقيمت تجربتان حقليتان في مزرعة خاصة بالسنبلاوين محافظة الدقهلية في الموسم الصيفي ٢٠٠٥ و ٢٠٠٦ وذلك لدراسة مدي الاستفادة من التسميد العضوي مقارنة بالتسميد المعدني مع الأصناف الأربعة لفول الصويا (جـ ١١١ ، كراوفورد ، جـ ٣٥ ، جـ٢١) ومعرفة تأثير هذه العوامل علي المحتوي البروتينى والزيت في البذور وكان التصميم المستخدم هو القطع المنشقة مرة واحدة واحتوت القطع الرئيسية على الأصناف والقطع الشقية على معاملات التسميد. وكانت النتائج المتحصل عليها كالتالي:

1-تفوق الصنف كراوفورد في ارتفاع النبات بالمقارنة بالأصناف الأخرى (جيزة ١١١ وجيزة ٣٥ وجيزة ٢١) في كلا الموسمين. في حين تفوق الصنف جيزة ٢١ في معظم الصفات والتي تتمثل في عدد الفروع علي النبات وعدد المجاميع الزهرية وعدد القرون علي النبات وعدد البذور في القرن وعدد البذور علي النبات ووزن ١٠٠ بذرة ومحصول البذور بينما تفوق الصنف كراوفورد في محصول القش بالمقارنة بالأصناف الأخرى في كلا الموسمين. أما الصنف جيزة ١١١ فقد كان الأفضل في صفة قطر الساق.

2-أدى استخدام المعاملة ٧٥% سبلة الدواجن + ٢٥% يوريا بالمقارنة بالمعاملات الأخرى إلي زيادة معنوية في كل الصفات المدروسة في كلا الموسمين.

3-أدي تسميد الصنف كراوفورد بـ ٧٥% سبلة الدواجن + ٢٥% يوريا في كلا الموسمين إلي زيادة معنوية في طول النبات ومحصول القش (طن/فدان).

4-لوحظ وجود تأثير معنوي للتفاعل بين الصنف جيزة ٢١ مع معاملة التسميد بـ ٧٥% سبلة الدواجن + ٢٥% يوريا في الموسم الأول. وأعطى أعلي قيمة لعدد الفروع علي النبات ونسبة الزيت.

5-لوحظ وجود تأثير معنوي للتفاعل بين الصنف جيزة ٢١ مع معاملة التسميد ٧٥% سبلة الدواجن + ٢٥% يوريا في كلا الموسمين وأعطي أعلى قيم لعدد المجاميع الزهرية على النبات وعدد الفروع علي النبات وعدد القرون علي النبات ووزن بذور النبات ووزن ١٠٠ بذرة ومحصول البذور بالطن للفدان ونسبة الزيت والبروتين في البذور.

وأخيراً توصي الدراسة باستخدام الصنف جيزة ٢١ والتسميد بخليط من سبلة الدواجن (٧٥%) والسماد المعدني (٢٥% يوريا) وذلك تحت ظروف محافظة الدقهلية. حيث أن أعلي قيم للنمو الخضري والمحصول ومكوناته وخصائص الجودة للصنف جيزة ٢١ تم التحصل عليها عند التسميد بـ ٧٥% سبلة الدواجن + ٢٥ % يوريا. هذا بالإضافة إلي الفوائد البيئية والأهمية الاقتصادية من جراء استخدام هذا النوع من التسميد.

Table 3: Means of No. of seeds and seeds weight/ plant, 100-seed weight, seed and straw yields, oil% and protein % as affected by different cultivars performance and fertilization treatments in 2005 and 2006 seasons.

Characters / Treatments	No. of seeds / plant		Seeds weight / plant (g)		100-seed Weight (g)		Seed yield (ton/fed)		Straw yield (ton/fed)		Oil (%)		Protein (%)	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Cultivars														
Giza 111	153.06	145.45	16.08	23.84	16.61	17.60	1.446	1.330	1.582	1.702	18.85	19.33	33.49	33.68
Crawford	160.54	168.68	18.12	24.43	16.72	18.00	1.462	1.349	1.633	1.783	18.95	19.25	32.95	34.14
Giza 35	172.06	178.42	19.26	24.50	17.10	18.30	1.466	1.523	1.559	1.724	21.40	19.75	33.60	34.57
Giza 21	179.79	194.03	21.13	25.82	17.76	18.64	1.744	1.603	1.549	1.693	22.35	20.15	33.71	35.13
F. test	*	*	*	NS	*	*	*	*	*	*	*	*	*	*
NLSD at 5%	2.89	1.46	0.65	-	0.61	0.54	0.023	0.029	0.051	0.029	0.51	0.67	0.42	0.46
Fertilization														
Farmyard (Fym)	135.73	158.04	15.40	23.09	15.42	16.76	1.359	1.320	1.449	1.623	19.31	18.10	31.00	31.67
Chicken (Ch.)	152.43	159.04	16.49	24.09	16.87	17.89	1.370	1.331	1.462	1.694	19.63	18.56	31.03	31.77
Urea	176.26	176.24	19.65	25.54	17.56	18.58	1.591	1.606	1.649	1.763	20.69	19.86	36.80	37.41
75% Fym + 25%Urea	164.93	173.16	18.99	25.36	16.99	18.25	1.535	1.361	1.639	1.729	20.25	19.50	31.05	33.26
75% Ch. + 25%Urea	202.44	190.84	22.69	25.54	18.38	19.19	1.794	1.639	1.705	1.820	22.06	22.00	37.30	37.81
F. test	*	*	*	*	*	*	*	*	*	*	*	*	*	*
NLSD at 5%	3.41	2.36	0.75	0.97	0.52	0.43	0.023	0.033	0.049	0.027	0.63	0.40	0.38	0.24
Interaction														
F. test	*	*	*	*	*	*	*	*	*	*	NS	*	*	*
NLSD at 5%	7.25	4.83	1.62	1.92	1.37	0.95	0.047	0.068	0.131	0.056	-	0.88	0.89	0.49

Table 4: Means of plant height, No. of branches/plant and No. of flowering groups per plant as affected by the interaction between cultivars performance and fertilization treatments in 2005 and 2006 seasons.

Characters / Treatments	plant height (cm)								No. of Branches/plant				No. of flowering groups / plant							
	2005				2006				2005				2005				2006			
	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21
Fym	67.7	75.2	63.9	63.5	75.4	65.0	75.8	64.3	3.0	3.2	3.2	3.1	16.1	20.7	20.2	21.7	16.3	22.8	22.0	21.3
Ch.	69.7	76.2	64.9	66.0	82.0	78.8	82.8	83.0	3.2	3.7	3.7	3.1	24.2	20.9	22.6	23.4	21.5	23.0	22.5	26.0
Urea	77.5	77.5	68.7	75.0	83.5	83.3	83.0	84.0	4.0	4.0	4.0	4.9	26.9	24.9	27.1	25.2	26.0	24.8	26.3	27.3
75%Fym+25%U	72.2	77.4	68.6	67.5	83.5	82.0	80.9	84.0	3.9	3.9	3.8	4.1	25.8	21.1	25.4	26.6	25.3	24.0	23.3	26.3
75%Ch.+25%U	80.8	84.5	82.5	75.9	86.3	86.5	83.5	85.5	4.1	4.0	4.6	4.9	29.0	25.0	28.4	30.5	26.5	26.0	26.3	29.3
F. test	*				*				*				*				*			
NLSDat 5%	3.3				3.8				0.3				1.5				2.0			

Table 5: Means of No. of pods and seeds per plan and seed weight as affected by the interaction between cultivars and fertilization treatments in 2005 and 2006 seasons.

Treatment	No. of pods per plant								No. of seeds per plant								Seed weight per plant							
	2005				2006				2005				2006				2005				2006			
	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21
Fym	42.3	54.0	54.3	56.1	54.0	54.5	54.3	63.8	114.9	123.8	150.6	153.7	133.8	135.2	133.5	187.0	12.25	14.08	15.50	18.28	21.95	20.38	22.50	23.28
Ch.	62.7	57.0	52.9	64.6	54.8	54.5	55.6	65.8	158.1	131.2	152.1	162.5	174.5	134.5	164.0	190.1	16.35	15.30	17.00	18.83	23.00	22.60	25.53	23.35
Urea	67.5	59.0	63.5	72.7	71.5	56.8	56.0	74.3	173.2	171.7	164.8	195.4	185.5	145.1	183.5	198.0	21.85	17.08	20.33	21.13	25.5	26.28	26.20	25.55
75%Fym+25%U	63.7	57.7	54.4	72.0	64.0	55.5	61.8	72.5	163.9	158.6	155.1	188.0	175.5	136.7	176.6	194.6	21.13	16.03	17.25	19.8	25.25	25.83	25.63	25.45
75%Ch.+25%U	68.3	66.5	78.7	79.5	73.8	72.5	72.8	75.8	180.1	199.4	214.5	215.5	174.5	192.7	200.0	211.6	22.88	17.77	20.50	27.6	26.05	26.48	26.28	26.60
F. test	*				*				*				*				*				*			
NLSD at 5%	6.5				3.7				1.6				1.9				1.62				1.92			

Table 6: Means of 100-seed weight and seed and straw yields as affected by the interaction between cultivars and fertilization treatments in 2005 and 2006 seasons.

Treatment	100-Seed weight								Seed yield (ton/fed)								Straw yield (ton/fed)							
	2005				2006				2005				2006				2005				2006			
	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21	G111	Craw.	G35	G21
Fym	14.79	14.85	15.88	16.10	15.61	16.80	16.88	16.84	1.248	1.248	1.414	1.451	1.35	1.248	1.337	1.281	1.352	1.385	1.433	1.437	1.46	1.624	1.652	1.657
Ch.	16.95	16.88	15.95	17.70	17.00	17.54	17.99	18.37	1.340	1.38	1.278	1.482	1.293	1.300	1.337	1.358	1.460	1.55	1.525	1.501	1.696	1.694	1675	1.736
Urea	17.40	17.45	16.63	18.60	18.42	18.77	19.07	19.39	1.563	1.445	1.402	1.638	1.35	1.362	1.344	1.388	1.639	1.680	1.605	1.675	1.724	1.938	1.731	1.776
75%Fym+25%U	17.25	16.90	16.13	17.78	17.86	17.72	18.30	18.74	1.451	1.490	1.639	1.671	1.857	1.356	1.319	1.890	1.638	1.658	1.545	1.636	1.705	1.722	1.713	1.774
75%Ch.+25%U	17.60	17.94	18.60	18.60	19.11	19.18	19.28	19.85	1.639	1.749	1.499	2.479	1.768	1.375	1.312	2.100	1.655	1.775	1.673	1.694	1.728	1.939	1.850	1.795
F. test	*				*				*				*				*				*			
NLSD at 5%	1.37				0.95				0.047				0.068				0.131				0.056			