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Forage Yield as Affected by Mixing Rates of Egyptian clover (*Trifolium alexandrinum L.*) With Ryegrass (*Lolium multiflorum*) Grown in Sandy Soil.

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Abstract

Two field experiments were conducted during the winter seasons of 2008/2009 and 2009/2010 in Research and Production Station of National Research Centre, Al Emam Malek Village, Al Nubaria District, Al Behaira Governorate, Egypt. Experiments aimed to study potential of mixture of Egyptian clover with ryegrass to increase forage yield and its quality grown under sandy soil conditions.

Five treatments were used i.e ryegrass (pure stand) 12kg seeds/fed., clover (pure stand) 20kg seeds/fed., ¼ Ryegrass +¾ clover, ½ Ryegrass +½ clover and ¾ Ryegrass +¼ clover.

Fresh and dry forage yield/fed. were determined for the three cuts as ton /fed. (First cut 60 days after sowing, second 50 days from the first while third cut 40 days later.) during the two seasons. Chemical composition and nutritional evaluation for dry forage yield was conducted. The obtained results showed that treatment of mixing ¾ clover + ¼ ryegrass mixture was the best treatment in fresh and dry yields as well as chemical components and nutritive evaluation i.e. crude protein, crude fiber, ether extract, nitrogen free extract, ash, digestible crude protein and total digestible nutrient in both seasons (as combined analysis of two seasons).

Key words: Forage mixtures – Egyptian clover –ryegrass.

Introduction

Egyptian clover is the first forage crop under Egyptian condition; its cultivated area was 1.07 million hectare /year in 2007 (**FAOSTAT 2012)**. Although it gave high forage yield and high protein % in forage but the dry matter is low.

Ryegrass (*Lolium multiflorum*, L.*)* is a native annual winter grass and adopted to a wide range of soils. It erect in habit and thus facilitates harvesting. It give also quick cover after cutting and give a good quality of hay.

Legume-cereal mixtures is low input technology has many useful effects on quantity and quality of forage mixture. It gave high forage yield with high protein content from legume plus high DM % and carbohydrates% from cereal which reflect on quantity and quality of forage mixture. Mixtures of Egyptian clover with ryegrass may improve forage yield and its quality. Potential benefits of mixtures include increased yields, protein and forage quality.

Cereals are high important in feeding ruminant animals for their high matter production and low cost. However, cereals forage is poor in protein content which shows their low quality and nutritive value. Regarding to high feed costs of protein supplementation, legumes can be used in livestock nutrition for their high protein content and providing cost saving .Thus grass-legume mixtures generally have high crude protein concentration and low fiber concentration than pure grass stand**. (Hamdollah *et al.*, 2009).**

Habernichit and Blake (1999) concluded that crop mixtures clearly have many advantages and are superior to monocultures, providing greater yield and quality stability and better exploiting all the resources available through enhanced crop plasticity. Moreover, annual legume-cereal mixtures have been attributed to weed, disease and insect suppressions. **Ross *et al.*, (2003) and (2004)** clear that increasing clover stand in mixture of (legume-cereal) clover and triticale or barley or oat increased forage yield and quality. **Blaser *et al.*, (2007)** concluded that addition of a red clover (*Trifolium pretense* L.) intercrop to winter cereal grains can supply forage and provide N to subsequent crops. **El- kramany *et al.*, (2009)** reported superiority of first cut at 60 DAS in clover forage yield and protein% followed by mixture of 75% clover+25% triticale but sole barley recorded the best DM% and carbohydrates% followed by 25% clover + 75% barley.

Materials and methods

Two field experiments were carried out during winter season of 2008/2009 and 2009/2010. The experimental soil was analyzed according to Chapman & Pratt 1978. Soil texture was sandy and its characteristics are shown in Table (1)

The experimental design was randomized complete block design experiment with three replicates which were of five seeding rates. Experimental field well prepared through two plugging and leveling then divided into experimental plots 3 × 3.5 m = 10.5 m^2 (1/400 fed.) fed. = 4200 m^2. Experimental area divided to five equal parts for seeding rates. The first for ryegrass pure stand, the second for clover clover pure stand , the third for

75% of clover and 25% of ryegrass ,the fourth for 50% of clover and 50% of ryegrass, the fifth for 25% of clover and 75% of ryegrass.

Table 1. Mechanical and chemical analyses of the experimental soil.

Sand%	Silt %	Clay%	CaCO3 %	Organic matter %	E.C. mmhos| cm^3	pH	S0luble N ppm	Available P, ppm	Exchan. K, ppm
91.2	3.7	5.1	1.4	0.3	0.3	7.3	8.1	3.2	20

The five experimental treatments can described as follows:
- Ryegrass (pure stand) 12kg seeds/fed.
- clover (Pure stand) 20kg seeds/fed.
- 1/4 Ryegrass +3/4 clover
-1/2 Ryegrass +1/2 clover
-3/4 Ryegrass +1/4 clover

All clover seeds were inoculated with specific *Rhizobium* strain. Clover and ryegrass, and their mixtures were sown on 29 October 2008 and 3November 2009 for the first and second seasons, respectively .The preceding crop was sunflower in the two seasons.

Three cuts were taken from each of the two seasons. First cut was obtained 60days post seeding date, the second cut was obtained after 50 days from the first one, while the third cut was taken after 40 days from the second cut.

Total nitrogen percentage was determined according to **Chapman and Pratt (1978).** Crude protein content was estimated by multiplying the analyzed total nitrogen by 6.25% for clover pure; by % 6.125 for clover 75%+ ryegrass 25% mixture; by 6.00 for clover 50% + ryegrass50% mixture; by 5.875% for clover 25% + ryegrass 75% mixture and by 5.75% for ryegrass pure.

Crude fiber percentage was determined according to the **A.O.A.C (2000)**

Chemical analysis of feedstuff samples were analyzed according to **A.O.A.C. (2000)** method. The investigated nutritive value of obtained forage material of the different treatments from the proposed mixture and their relevant in pure stands included Crude protein(CP), Crude fiber(CF), Ash, Nitrogen free extract NFE),Ether extract(EE), Digestible crude protein(DCP), Total digestible nutrient(TDN) and Total digestible nutrient yield (TDNY) were determined according to the described by **NRC(1977).**

Data were statistically analyzed according to **Snedecor and Cochran (1990).** The combined analysis was conducted for the data of two seasons since the results of the two grown seasons followed a similar trend. The least significant differences (LSD) at the level of 5% significance was used to compare the treatments means.

Results and discussion

Results presented in Tables 2,3,4, 5 and 6 show effect of seeding rates of either pure stand or mixtures between Egyptian clover (legume) and ryegrass (cereal) at 1st, 2nd , 3rd cuts in 2008/2009 and 2009/2010 seasons. Quantity and quality of forage mixture as affected by different seeding rates show significant differences between treatments for all studied characters as combined analysis of two seasons.

1. Forage Yield

1- Fresh forage yield (Ton/ Fed.):-

Table (2) show significant differences between ryegrass, clover mixture in 3 cuts and total of them in fresh forage yield (ton/fed.). The heaviest fresh yield recorded by 2nd cut followed by 1st cut and 3rd cut was the third. The highest fresh forage yield 14.01 ton/fed. produced by ¾ clover + ¼ ryegrass in 2nd cut followed by ¾ clover + ¼ ryegrass in 1st cut (13.85 ton/fed.) and the third was clover pure stand in 2nd cut (13.164 ton/ fed.). Superiority of ¾ clover + ¼ ryegrass mixture which recorded the first order in 1st and 2nd cut may be due to integration effect of highest no. of clover plants under the same mixture and the increase in no. of ryegrass and clover from 1st to 2nd to 3rd cuts under trial condition. Results are in harmony with those obtained by **Ross *et al*., (2003&2004); Awn (2005).** Advantage of ryegrass with clover mixtures than their prevalent pure stand in many aspects as fresh yield had been reported by **Blaser *et al*., (2007), El kramany *et al*., (2009) and Hamdollah *et al*., (2009)**. It can be concluded that superiority of pure stand of Egyptian clover under trial condition is logical result it may be due to higher canopy and branches of legumes than cereals (ryegrass). **El-Sheikh (1998)** found that fahl-ryegrass mixture produced the highest value leafiness on fresh weight basis.

2. Dry forage yield (Ton/ Fed.):-

Results presented in Table (3) that treatment of ¾ clover +¼ ryegrass significantly surpassed mixtures of forage crops in dry forage yield in1st to 2nd to 3rd cuts. In three cuts and total of them. 1.304 – 2.442-3.568ton/ fed. Dry forage yield was arranged in ascending order from 1st to 2nd and 3rd cuts. **El – Selaimi (1991), Mousa and El- Nabawi (1995), El-**

Sheikh (1998); Riday and Albrecht (2012) stated the same results. In kura clover/red clover mixtures with a grass companion, the optimal seeding ratios between forage legumes were 75:25 kura clover/red clover. Mixtures containing kura clover and red clover had the greatest percentage forage legume dry matter (above 50%)

Table 2. Fresh forage yield (ton/fed.) of sole and mixture crops as affected by mixing (Combined analysis of 2008/2009 and 2009/2010) .

Treatments	Fresh forage yield (ton/fed.)			
	1st cut	2nd cut	3rd cut	Total
Ryegrass	8.516	8.800	7.772	25.088
clover	11.848	13.164	10.099	35.111
3/4 clover, 1/4 Rye	13.858	14.017	10.870	38.746
1/2 clover , 1/2 Rye	12.680	13.000	9.783	35.463
1/4 clover, 3/4 Rye	10.944	11.716	8.924	31.584
mean	11.569	12.139	9.490	33.198
L.S.D. at 5%	0.310	0.300	0.340	0.830

Table 3. Dry forage yield (ton/fed.) of sole and mixture crops as affected by mixing (combined analysis of 2008/2009 and 2009/2010)

Treatments	Dry forage yield (ton/fed.)			
	1st cut	2nd cut	3rd cut	Total
Ryegrass	0.985	1.811	2.957	5.752
clover	0.983	2.134	3.149	6.265
3/4 clover, 1/4 Rye	1.304	2.442	3.568	7.314
1/2 clover ,1/2 Rye	1.207	2.309	3.405	6.921
1/4 clover ,3/4 Rye	1.075	2.154	3.204	6.433
mean	**1.111**	**2.170**	**3.257**	
L.S.D. at 5%	0.040	0.050	0.100	0.13

II Chemical Composition and Nutritional Evaluation:

The conducted chemical analysis of forage quality components on dry weight basis include the followings:

1-Crude protein (CP):-

Data presented in Tables (4, 5,6) show differences in CP concentration between mixtures. The results in the same tables (4, 5, 6) show that clover exerted relatively higher % of CP than ryegrass in their pure stand. These results were clear for the second and later cuts of the two seasons .In pure stand of clover CP percentage decreased gradually from 20.79%, to 19.77%, and 16.42% from 1st cut to 3rd cut respectively Also CP in ryegrass decreased from 14.96%, to 13.02%, to 11.13% from 1st cut to 3rd cut .In general, results show that the higher CP content

(258.34 kg/fed.) was recorded by mixing ¾ clover +¼ ryegrass in the first cut and 431.62kg/fed. in second cut but in the third cut the higher CP results by clover pure

(517.05kg/fed.) Followed by ¾ clover +¼ ryegrass(477.06kg/fed.).

CP content increased gradually from the first cut to the third cut. Similar results obtained by **Shan chen *et al.*, (2012).**

However, CP content of clover clover in mixed was not negatively affected may be due to its high growth rate. These results are in agreement with those obtained by **Thompson and Stout (1997).**

The above mentioned results indicate that such increase in CP content of the forage plant (either legumes or with mixing with grasses) in the later than the earlier cuts is more likely due to the more leaf/stem ratio of the later cuts than the later ones. Such leaves are more active in CP synthesis and accumulation **(Muhrez *et al.*, 1995 and Shan chen *et al.*, 2012).**

The obtained results also claimed that for all studied forage mixture of clover and ryegrass the its CP content were higher with mixing ryegrass with clover than ryegrass pure. These results may be attributed to the benefits of rhizobium inoculation of clover seeds acted positively in fixing ambient nitrogen. Such nitrogen takes its own role in protein synthesis and accumulation for the associated forage plants in their mixture. These results are in harmony with those obtained by **Ross *et al.*, (2004).**

The results of this study also indicated that intercropping of clover with ryegrass at the seeding rate of ¾ clover to ¼ ryegrass could be used as alternative practice of clover sole crop for high protein production.

2-Crude fiber (CF):-

Data presented in Tables (4, 5, 6) show that ryegrass exerted relatively higher CF than clover in their pure stand or mixing.

These results percentage were clear for the earlier and later cuts of the two seasons. In pure stand of ryegrass CF percentage increased gradually from 18.90 % to 20.91% to 22.90%% from 1st cut to 3rd cut, respectively. Also clover CF percentage increased gradually from 16.71% to 18.72 % to 20.21 % from 1st cut to 3rd cut. Concerning the mixing effect, the same trend observed CF % increased gradually from the first cut to the third cut. The higher CF % (18.52) results from mixing ¼ clover + ¾ ryegrass followed by ½ clover + ½ ryegrass (17.90 %) then ¾ clover +¼ ryegrass. Regarding CF content the same Table indicate that in general CF increased gradually from the 1st cut to 3rd cut on all mixing treatments. However, the highest CF content was reported by ¾ clover +¼ ryegrass (224.81kg/fed.) in the first cut,(483.15kg/fed.) in the second cut, and (744.82kg/fed.) in the later one. Similar results were recorded by **El- Selaimi (1991).** Such higher content of ¾ clover +¼ ryegrass mixture inspirer of its lower CF concentration may be attributed to the higher dry matter of such forage mixture.

From the above mentioned results, it is well known that grasses with its nature of steaming structure possess more CF percentage than leguminous clover in their pure stand. In this respect **Fulkerson *et al.*, (2007)** reported that grasses has much higher hemicellulose than legumes. Thus, the higher CF concentration of ryegrass imposed its impact on the lower CF of the associated clover, which came up with nearly moderate CF concentration. In general, those results are in accordance with those obtained by **Francisco *et al.*, (2003) and Fulkerson *et al.*, (2007).**

3- Ash:-

Data presented in Tables (4, 5, 6) reveal that for clover pure in the 1st cut exerted relatively higher ash % than ryegrass in their pure stand and mixing .These results were clear for the earlier and later cuts. In pure stand of clover ash percentage decreased gradually from 18.18% to16.43% and 14.23 from 1st cut to 3rd cut respectively. Also ryegrass ash% decreased gradually from 17.05 % to 15.34 % to 13.11 % through 1st cut to 3rd cut. Concerning mixing the same Tables also showed that mixing clover with ryegrass affected ash percentage in all cuts. However, the highest ash % (17.89) was recorded by mixing ¾ clover +¼ ryegrass followed by ½ clover + ½ ryegrass (17.57%) then ¼ clover + ¾ ryegrass.

As regarding the ash content the highest might (233.24kg/fed.) was resulted by ¾ clover +¼ ryegrass followed by ½ clover + ½ ryegrass (212.01) then ¼ clover + ¾ ryegrass (187.16kg/fed.). Ryegrass pure the lowest produce ash content (167.99kg/fed.). Ash content increased from 1st cut to 3rd cut in all mixing treatments. In general, these results were in accordance with those reported by **El- Selaimi (1991) and Abd El- Shafy and Ali (1996).** The relatively high ash content of the earlier cuts as compared with the later one in ryegrass and clover may be attributed to mineral absorption and accumulation as a result of the high activity of the plants during the active earlier studies of growth than later ones.

4-Nitrogen free extract (NFE):-

The effect of mixing clover with ryegrass in NFE percentage and content are shown in Tables (4,5,6) which showed relatively higher with noticeable magnitudes NFE percentage of ryegrass than clover in their pure stand. Moreover, the same Tables (4,5,6) also showed that in general, NFE percentage increased gradually from 1st cut through 3rd one for either grasses or legumes in their pure stands. The same trend was also true for different mixtures of ryegrass and clover**. El –Hakim (1990) and El kramany *et al.*, (2009)** reported similar results in this respect.

As for NFE content as kg/fed. Tables (4,5,6) show that NFE content highly increased from 1st cut to 3rd cut, and the highest NFE content was recorded by ¾ clover + ¼ ryegrass in the 3rd cut (1602.9). In general, there was a progressive and consistent increase nitrogen free extract as the clover seeds increased in the mixture. This was true in the three cuts. In addition, the promoting effect of clover in enhancing nitrogen free extract is to be expected since clover plant is a leguminous plant and can get benefit from nitrogen gas through nodule bacteria root of clover secrete nitrogen compounds which stimulate the nitrogen uptake of neighbor in ryegrasses.

5-Ether extract (EE):-

The effect of mixing clover with ryegrass in ether extract percentage and content are shown in Tables (4, 5, 6) which show relatively higher with noticeable magnitudes EE percentage for ryegrass than clover. Moreover, in generally EE percentage decreased gradually from 1st cut through 3rd one for grasses and legumes in their pure stands. The same trend was also clear with different mixtures of ryegrass and clover. As for EE content dada in Tables (4, 5, 6) show that Ether extract content highly increased from 1st cut to 3rd cut .and that the highest EE content was recorded by pure stand of ryegrass in the 3rd cut (74.37kg/fed.) .The same Table also show that EE content of pure stand of ryegrass the EE content increased significantly by mixing clover with ryegrass in the 2nd and 3rd cuts.

The above mention increase in EE content with different reversely EE percentage is more likely due to the progressive increase of dry weight of the plants from the earlier cuts to the latter one.

6- Digestible crude protein (DCP):-

Data presented in Tables (4,5,6) show differences in DCP concentration between mixtures. The same Tables showed that clover exerted relatively higher DCP than ryegrass in their pure stand. These results were clear for the second and later cuts of the two seasons. In pure stand of clover DCP percentage decreased gradually from 15.18 %, to 14.31% to 11.46 % from1st cut to 3rd cut, respectively. Also DCP in ryegrass decreased from 10.19 %, to 8.57 %, to 6.96 % from 1st cut to 3rd cut .Results also showed that the higher DCP content (188.09 kg/fed.) was reported by in mixing ¾ clover +¼ ryegrass in the first cut. but the higher record reported in second cut 306.71 kg/fed. and in the third cut (363.27) kg/fed. DCP content increased gradually from the first cut to the third cut. **Muhrez et *al.*, (1995)** came the same results.

7- Total digestible nutrients TDN:-

Data presented in Tables (4, 5, 6) clear differences in TDN concentration between mixtures. The results show that ryegrass pure exerted relatively higher TDN than clover in their pure stand. These results were clear for the second and later cuts of the two seasons .In pure stand of ryegrass TDN percentage decreased gradually from 68.56 %, to 66.63% to 64.85% from 1st cut to 3rd cut respectively Also TDN in clover decreased from 65.68 %, to 64.20 %, to 62.43 % from 1st cut to 3rd cut. In general, also showed that the higher Total digestible nutrients yield TDNY(875.33kg/fed.) was obtained for mixing ¾ clover +¼ ryegrass in the first cut, and 1594.24 in the second cut and 2240.97 in the third cut respectively. TDNY content increased gradually from the first cut to the third one. These results are in agreement with those obtained by **Muhrez et *al.*, (1995)** in this respect it is worthy to note that there was positive correlation between CP% and TDN %.

Conclusion

It was clear from obtained results that forage yield of pure stand of Egyptian clover produced the highest forage yield (ton/fed.) and protein% in forage but sole ryegrass gave the highest crude fiber %. Performance of (legume-cereal) mixtures was influenced by cereal density, thus, mixture of ¾ clover + ¼ ryegrass may improve forage quality and yield. Potential benefits of mixture include increased yields, increas protein and forage quality, N contributions from legumes, greater yield stability, and incidence of weeds. Lower total season DM yield at low cereal density was balanced by a greater protein contribution from larger clover components. However, farmers are unlikely to adopt the increased cost and complexity of managing intercrops without demonstrated evidence of potential advantages over mono cropping it is possible to make Egyptian clover-ryegrass mixture by ¾ clover + ¼ ryegrass from recommended seeding rates without increasing cost. Generally, it can be concluded that these study need additional studies on effect of forage mixture on animal feeding.

Table 4. Chemical constituents and total digestible nutrients of the proposed forage mixture and relevant pure stand for percentage and content (kg/fed.) (combined analysis of 2008/2009 and 2009/2010) First cut

	CP		CF		Ash		NFE		EE		DCP		TDN	
Treatments	%	content	%	content	%	content	%	content	%	content	%	content	%	content
Ryegrass	14.96	147.33	18.90	186.17	17.05	167.99	45.69	457.73	3.40	33.49	10.19	101.78	68.59	680.60
Clover	20.79	204.41	16.71	164.25	18.18	178.75	41.74	370.98	2.58	25.31	15.18	150.15	65.68	648.42
1/4 Rye, 3/4 Clover	19.81	258.34	17.24	224.81	17.89	233.24	42.22	522.71	2.84	37.03	14.34	188.09	66.72	875.33
1/2 Rye,1/2Clover	18.66	225.17	17.90	216.05	17.57	212.01	43.39	504.71	2.49	30.05	13.37	161.63	67.44	815.10
3/4 Rye,1/4Clover	16.14	173.55	18.52	199.04	17.41	187.16	44.88	473.32	3.06	32.84	11.06	120.61	67.96	737.80
Mean	**18.07**	**201.76**	**17.85**	**198.06**	**17.62**	**195.83**	**43.58**	**465.89**	**2.87**	**31.75**	**12.83**	**144.45**	**67.28**	**751.45**
L.S.D.at 5%		**6.29**		**6.98**		**6.60**		**21.06**		**1.26**		**4.35**		**26.35**

Table 5. Chemical constituents and total digestible nutrients of the proposed forage mixture and relevant pure stand for percentage and content (kg/fed.) (Combined analysis of 2008/2009 and 2009/2010) Second cut.

	CP		**CF**		**Ash**		**NFE**		**EE**		**DCP**		**TDN**	
Treatments	**%**	**content**	**%**	**content**	**%**	**content**	**%**	**content**	**%**	**content**	**%**	**content**	**%**	**content**
Ryegrass	13.02	235.79	20.91	378.59	15.34	277.72	47.92	875.08	2.82	51.07	8.57	155.95	66.63	1212.05
Clover	19.77	421.93	18.72	399.38	16.43	350.51	42.69	870.78	2.40	51.22	14.31	306.71	64.20	1374.40
1/4 Rye, 3/4 Clover	17.68	431.62	19.79	483.15	16.13	393.89	43.92	1049.40	2.50	60.93	12.52	306.49	65.10	1594.24
1/2 Rye,1/2Clover	15.10	348.59	20.12	464.57	15.93	367.82	46.28	1015.73	2.58	59.46	10.35	240.57	65.61	1519.04
3/4 Rye,1/4Clover	13.86	298.57	20.54	442.32	15.67	337.53	47.28	976.62	2.65	57.08	9.28	201.00	66.10	1428.06
Mean	**15.89**	**347.30**	**20.01**	**433.60**	**15.90**	**345.50**	**45.62**	**957.52**	**2.59**	**55.95**	**11.01**	**242.14**	**65.53**	**1425.56**
L.S.D.at 5%		8.55		10.88		8.59		29.38		1.53		5.93		36.39

Table 6. Chemical constituents and total digestible nutrients of the proposed forage mixture and relevant pure stand for percentage and content (kg/fed.) (combined analysis of 2008/2009 and 2009/2010) Third cut

	CP		**CF**		**Ash**		**NFE**		**EE**		**DCP**		**TDN**	
Treatments	**%**	**content**	**%**	**content**	**%**	**content**	**%**	**content**	**%**	**content**	**%**	**content**	**%**	**content**
Ryegrass	11.13	329.24	22.90	677.01	13.11	387.51	50.35	1518.57	2.52	74.37	6.96	213.61	64.85	1977.71
Clover	16.42	517.05	20.21	636.41	14.23	447.95	47.38	1322.58	1.77	55.74	11.46	363.27	62.43	1972.02
1/4 Rye, 3/4 Clover	13.37	477.06	20.88	744.82	13.95	497.74	49.94	1602.92	1.87	66.54	8.87	318.01	62.71	2240.97
1/2 Rye,1/2Clover	12.82	436.46	21.32	725.78	13.57	462.06	50.35	1569.19	1.95	66.23	8.39	287.42	63.62	2170.35
3/4 Rye,1/4Clover	11.99	384.10	22.04	706.00	12.25	392.37	51.66	1538.72	2.07	66.32	7.70	247.66	64.07	2056.39
Mean	**13.15**	**428.78**	**21.47**	**698.00**	**13.42**	**437.52**	**49.94**	**1510.40**	**2.03**	**65.84**	**8.68**	**285.99**	**63.53**	**2083.49**
L.S.D.at 5%		**13.03**		**22.22**		**13.85**		**25.29**		**2.12**		**8.63**		**64.33**

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"تأثر محصول العلف الناتج من خلط معدلات البرسيم المصري مع الراي جراس النامية فى الأراضى الرملية"

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جيهان شاكر حنا باخوم – باحث مساعد بالمركز القومى للبحوث

أجريت تجربتان حقليتان خلال الموسمين الشتويين 2008–2009 و 2009–2010 بمحطة تجارب البحوث الزراعية للمركز القومي للبحوث قرية الامام مالك– النوبارية محافظة البحيرة لدراسة أثر نسب مختلفة من البرسيم المصري مع الراي جراس على المحصول و جودتة تحت ظروف الاراضى الرملية فى تصميم قطاعات كاملة العشوائية فى ثلاث مكررات.

و قد أشتملت التجربة علي 5 معاملات

معاملات المخاليط

1– راي جراس منفرد 12 كم/ ف 2– برسيم منفرد 20 كم/ ف 3– مخلوط ¼ راي جراس+ ¾ برسيم

4 – مخلوط ½ برسيم + ½ راي جراس 5 – ¾ راي جراس+ ¼برسيم

هذا و قد تم تحليل النتائج احصائيا كمتوسط لمحصول الموسيمين و مقارنة النتائج عن طريق أقل فرق معنوى علي مستوى 5%

تم تقدير المحصول الغض و الجاف في 3 حشات (الحشة الاولى بعد 60 يوم من الزرعة و الثانية بعد 50 يوم من الحشة الاولى و الثالثة بعد بعد 40 يوم من الثانية خلال الموسيمين الزراعيين.

وتقدير النسب المئوية لكل من المركبات المختلفة و كذا محصول الفدان من هذة المركبات على أساس الوزن الجاف .

و أوضحت النتائج

1– تفوق معاملتى البرسيم المنفرد و كذا مخلوط ¼ راي جراس + ¾ البرسيم فى محصول العلف الغض و الجاف و النسبة المئوية و محصول كل البروتين الجاف و المهضوم و الدهن المواد الغذائية الكلية

2– تفوقت معاملتي الراى جراس المنفرد و المخلوط ¾ راي جراس +¼ البرسيم فى الالياف الخام و المواد الخالية من النتروجين

3– تفوقت معاملة المخلوط ¼ راي جراس + ¾ البرسيم على بقية المخاليط فى جميع الصفات التى درست (كمتوسط للسنتين)