J. Agric. Sci. Mansoura Univ., 30 (12): 8235 - 8248, 2005

EFFECT OF SINGLE CLIPPING ON YIELD COMPONENTS, CHEMICAL COMPOSITION, PHYSICAL AND TECHNOLOGICAL PROPERTIES OF SOME WHEAT VARIETIES UNDER DIFFERENT NITROGEN FERTILIZATION LEVELS

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ABSTRACT

Getting one clip from wheat varieties helps in animal nutrition during winter time and balances C/N ratio in animal feed and increase the economic importance of wheat. Two trials were conducted at Al-Bustan area (west Delta) in 2002/2003 and 2003/2004 growing seasons. Three bread wheat varieties were used: Sids 1, Giza 168 and Gemmeiza 9, and five rates of nitrogen fertilization (50, 75, 100, 125, 150 kg/fed). Clipping was done after 45 days from sowing at 7 – 10 cm above soil surface The results of the statistical analysis indicated that clipping significantly reduced grain yield from 13.7 to 12.4 and from 14.9 to 13.9 ardab / feddan in the two respective growing seasons in spite of reduction in yield components was insignificant in both seasons. Concerning the dry weight of forage production, it dropped off from 0 52 to 0.42 and from 0 50 to 0.41 ton / fed in the two seasons, respectively, when nitrogen rate decreased from 75 kg to 25 kg / fed (half amount which used until 45 days). Also, the highest forage dry weight was obtained from Gemmeiza 9 variety in both seasons, whereas Sids 1 gave the lowest production of forage dry weight in both seasons. Cutting decreased all chemical composition (except total carbohydrates), wet and dry gluten and farinograph parameters (water absorption, mixing time and stability). On the other hand, increasing nitrogen rate increased protein and oil contents, flour extraction, wet and dry gluten and stability of dough, whereas it decreased ash, fiber and total carbohydrates content and bran extraction The best bread wheat variety was Sids 1, due to the highest values of protein content, flour extraction and stability of dough, followed by Gemmeiza 9 then Giza 168.

Keywords: Single clipping, bread wheat, nitrogen fertilization, chemical and physical properties

INTRODUCTION

Wheat is one of the main cereal crops all over the world, and one of the most important winter crops in Egypt. In many countries, wheat is the major component of the diet as it has a good nutritional profile (Bushuk and Rasper, 1994). The usefulness of wheat for forage or grazing during early growth stages, and later, for harvesting the grain in the regrowth, has been pointed out in some recent studies (Kenneth *et al*, 1995 and Hanna *et al*, 1995 a and b). This dual management permits forage production early in the season in addition to the grain yield later. Most studies have found a reduction in wheat grain yield after forage removal, but some yield increase or not seriously decrease have been reported after clipping when wheat was cultivated under favorable conditions and clipped in proper time (Royo and Romagosa, 1996). The decrease in grain yield mostly associated with the removal of shoot apices by grazing or clipping, or reduced number of spikes per m² at harvest and also reduced number, size or weight of grains (Boriachela *et al.*, 1995 and Royo and Tribo, 1997). It is important to know which cultivars are best adapted to grazing or clipping plus grain management system. It is true, if genetic differences indeed exist (Eugenen *et al.*, 1992). A strong relationship appeared between grain yield in the uncut wheat and grain yield after forage removal, suggesting that breeding wheat cultivars for dual purpose could take advantage of the efforts made to increase grain yield potential (Royo and Tribo, 1997). Epplin *et al.* (2000) estimated wheat grain yield response to seeding rate and planting date. El-Doubly (1997) reported that application of nitrogen level up to 60 kg/fed increased significantly plant height, yield and their components. Also, protein content increased gradually by increasing N levels. Yong-ging *et al.* (1996) indicated that lower nitrogen application reveals a weaker accumulation of gluten and has a positive correlation with storage protein. Also, dough strength is related to increasing net gluten. Toaima *et al.* (2000) found that protein content, wet and dry gluten, and flour extraction increased by increasing N-level from 40 to 80 kg/fed. They found also that N- fertilization increased farinograph properties (water absorption, mixing time and stability). True *et al.* (2001) found that wheat pasture is an available source of high-quality forage, it is high in protein, energy and minerals and low in fiber.

The aim of this study is using wheat as a double purpose crop for both grain and forage yield. Wheat can replace clover in some area in Egypt to increase total wheat cultivated area and total grain production to decrease the gap between consumption and production, beside one cutting for forage to feed animals. This could solve a part of wheat production problems in Egypt.

MATERIALS AND METHODS

Two trials were conducted in 2002/2003 and 2003/2004 growing seasons at Al-Bustan area (West Delta). The soil was sandy. The treatments were as follow:

1- Three bread wheat cultivars (Sids 1, Giza 168 and Gemmeiza 9).
2- Five nitrogen rates (50-75-100-125-150 kg N/Fed.).
3- Two clipping treatments, i.e. non clipping (control) and clipping.

Treatments were arranged in split-split plot design in three randomized complete block. The three varieties were distributed randomly in the main plots, while nitrogen rates were arranged in the sub plots and the sub-sub plots were occupied by the clipping treatments

Nitrogen fertilization was in the form of ammonium nitrate (33.5%) and splitted into six equal doses; three doses (half amount) were applied before clipping and the other three doses were applied after clipping. Clipping had been done after 45 days from sowing at 7-10 cm above soil surface. The cultural practices of growing wheat were followed as recommended for the region. The drill seeding method was conducted in rows and the plot size was 8.4 m^2 (12 rows, 3.5 m long and 20 cm apart). The experiments were sown during the third week of November in the two seasons.

At crop maturity, 5.6 m^2 (8 rows, 3.5m long, 20 cm a part) area were manually harvested at ground level from each plot and mechanically threshed to estimate the grain yield and adjusted to ardab per feddan and straw yield was calculated as the difference between total yield and grain yield and adjusted to ton/feddan.

The three yield components were collected from each plot as follow: (1) Number of spikes/m^2, estimated as number of heads of the two middle rows and adjusted to number of spikes per m^2, (2) Number of grains per spike estimated on the basis of 10 spikes, randomly collected and (3) 1000 kernel weight (g) estimated as an average of 3 samples.

Concerning forage yield, 8.4 m^2 (12 rows, 3.5m long, 20 cm a part) area were clipped from each clipping treatment to estimate the forage yield in ton per feddan.

Chemical analysis: moisture, protein, ash, fiber and oil contents were determined according to A.O.A.C. (2000). Total carbohydrate were calculated by difference.

Physical properties: Hectoliter, extraction, wet and dry gluten and farinograph parameter were determined according to A.A.C.C, (1990).

Analysis of variances were conducted for each experiment according to Steel and Torrie (1980).

RESULTS AND DISCUSSION

Yield components

Clipping insignificantly decreased number of spikes per m^2 in both seasons (Table 1). Data in Table 1 showed that nitrogen rates significantly affected number of spikes/m^2 where 150 kg N/fed had the highest number of spikes/m2 in the first season, whereas 125 kg N/Fed showed the highest number in the second season. Number of spikes/m^2 did not significantly differ between varieties in the two seasons. Sids 1 with 125 kg N/Fed and Gemmeiza 9 with the same rate of nitrogen gave the highest number of spikes/m^2 in the two Seasons respectively. Sids 1 under 125 kg N with control treatment as well as Gemmeiza 9 under 150 kg N/fed with control treatment showed the highest number of spikes/m^2 in the first season.

Number of kernels per spike insignificantly affected by clipping treatments in the two seasons (Table 2). The rate of 100 kg N/fed had the highest number of grains per spike with 44.7 in the first season, while no significant differences were found between nitrogen treatments in the second season. No significant differences were found between varieties in number of kernels per spike in the two seasons. Gemmeiza 9 with 75 kg N/fed gave the highest number of kernels per spike with 50.7 in the first season, whereas Sids 1 under 125 kg N/fed in the second season showed the highest number of grains/spike with 49.4. Gemmeiza 9 under control treatment gave the

was the lowest in straw yield. Nitrogen rate caused significant influence on straw yield in the first season with rate of 125 kg/fed. Clipping showed insignificant effect on straw yield in both seasons. The interaction between varieties and nitrogen levels was significant in both seasons. Giza 168 under 125 kg N/fed in the first season as well as the same variety under 75 kg N/fed in the second season gave the highest straw yield (4.1 and 4.2 t/fed. respectively). Varieties Giza 168 and Gemmeiza 9 under control treatment in the two seasons had the highest straw-yield. Nitrogen rate of 125 kg/fed under control treatment showed the highest straw yield in the first season with value of 4.1 ton/fed, while under control treatments in the second season, nitrogen rates of 75, 125, 150 kg/fed showed the highest straw yield with value of 4 ton/fed, Gemmeiza 9 under 100 kg nitrogen with cutting treatment had the highest straw yield (4.4 ton/fed) in 2002/2003 season.
Forage dry weight (ton/fed)

Table (5): Effect of single clipping on straw yield (ton/fed) of some wheat varieties under different nitrogen levels.

Variety	kg N/fed	20002/20003			2003/2004		
		Control	Cutting	Mean	Control	Cutting	Mean
Sids 1	50	3.1	3.3	3.2	3.5	3.2	3.4
	75	3.5	2.9	3.2	3.7	3.5	3.6
	100	3.4	3.6	3.5	3.9	4.1	4.0
	125	3.8	3.5	3.7	4.0	3.8	3.9
	150	4.0	3 8	3.9	3.8	3.3	3 6
	Mean	3 6	3.4	3.5	3.8	3.6	3.7
Giza 168	50	3.5	3.1	3.3	4.0	3.7	3 9
	75	3.7	3.8	3.8	4.1	4.3	4.2
	100	4.1	3.7	3.9	3.5	3.8	3.7
	125	4.2	4.0	4.1	3.6	3.4	3.5
	150	3.4	3.6	3.5	4.2	4.0	4.1
	Mean	3.8	3.6	3.7	4.0	3.8	3.9
Gemmeiza 9	50	3.3	3.6	3.5	3.5	3.7	3.6
	75	4.1	3.9	4.0	4.1	4.1	4 1
	100	3.7	4.4	3.9	3.9	3.7	3 8
	125	4.3	3.4	3 9	4.4	3 8	4.1
	150	3.8	3.7	3.8	4.1	3.8	4.0
	Mean	3.8	3.8	3.8	4 0	3.8	3 9
Mean	50	3 3	3.3	3.3	3.7	3.5	3.6
	75	3.8	3 5	3.7	4.0	3.9	4.0
	100	3.7	3.9	3.8	3.8	3.9	3.9
	125	4.1	3.6	3.9	4.0	3 7	3.9
	150	3.7	3.7	3.7	4.0	3 7	3.9
	Mean	3 7	3.6	3 7	3.9	3.7	3.8

LSD at 0.05 for		2002/2003	2003/2004
	Varieties	0.2	NS
	Nitrogen levels (N)	0.3	NS
	Cutting (C)	NS	NS
	V χ N	0.4	0.3
	V χ C	0.3	0.2
	N χ C	0.4	0.3
	V χ N χ C	0.4	NS

As shown in Table (6), varieties differed significantly in their forage dry weight in the two seasons. Gemmeiza 9 significantly showed the highest forage dry weight in both seasons with values of 0.51and 0.50 ton/fed, respectively. Nitrogen rates (half amount) also significantly affected forage dry weight in both seasons. Rate of 75 kg/fed caused maximum forage dry weight in both seasons. The interaction between varieties and nitrogen levels was also significant in 2002/2003 and 2003/2004 seasons, where Giza 168 under 75 kg N/fed in the first season and Gemmeiza 9 under the same level of nitrogen in the second season showed maximum forage dry weight with values of 0.56 and 0.55 ton/fed, respectively.

Table (6): Forage dry weight (ton/feddan) as affected by varieties under half amount of nitrogen levels

kg N/fed	20002/20003				2003/2004			
	Sids 1	Giza 168	Gemmeiza 9	Mean	Sids 1	Giza 168	Gemmeiza 9	Mean
25	0.42	0 38	0.47	0 42	0.37	0.41	0 44	0 41
37.5	0.39	0 42	0.50	0.44	0.42	0.52	0 50	0 48
50	0.47	0.49	0.54	0.50	0.48	0.49	0.47	0.48
62.5	0.45	0.51	0.55	0.50	0.44	0.48	0.52	0.48
75	0.52	0.56	0.49	0.52	0.46	0.50	0.55	0.50
Mean	0.45	0.47	0.51	0.48	0.43	0.48	0.50	0.47

LSD at 0.05 for		2002/2003	2003/2004
	Varieties	0.05	0.04
	Nitrogen levels (N)	0.06	0.07
	V x N	0.08	0.06

From Tables (4, 5 and 6), it could be concluded that clipping significantly reduced grain yield in both seasons, while the reduction in straw yield was insignificant in both seasons. Nitrogen rates significantly affected grain and straw yield in both seasons. Cultivars significantly differed in grain and straw yield values under the treatments of clipping and nitrogen in both seasons. Gemmeiza 9 showed the highest forage dry weight in both seasons. The rate of 75 kg N/fed caused maximum forage dry weight in the tow seasons.

Chemical composition of wheat grains

Data in Table (7) show the chemical composition of wheat grains (variety Sids 1,Giza 168 and Gemmeiza 9) as a result of fertilization with different levels of nitrogen i.e., 50, 75, 100, 125 and 150 kg/fed with cutting and without cutting (control). Protein content increased with increasing nitrogen levels at all samples. It ranged from 13.9% to 15.8%, 12.1% to 13.0% and 13.4% to 14.4% for the three varieties (Sids 1, Giza 168 and Gemmeiza 9), respectively. On the other hand, cutting decreased protein content. These results affirmed with Zohry *et al.* (1998), who mentioned that crude protein increased by increasing N level. Concerning ash and fiber, increasing N levels decreased ash and fiber content. The same trend was shown with total carbohydrates. On the other hand, oil content increased with increasing N levels. The data showed that Sids 1 variety was the best variety in protein content. Concerning cutting, data revealed that cutting decreased all chemical composition, except total carbohydrates.

It could be concluded that increasing N rates increased protein and oil contents, whereas ash, fiber and total carbohydrates were decreased. On the other hand, cutting decreased all chemical composition except total carbohydrates.

Table (7): Effect of single clipping on chemical composition of wheat grains varieties (on dry basis) under different nitrogen levels.

	kg N/fed	Sids 1		Giza 168		Gemmeiza 9	
		Control	Cutting	Control	Cutting	Control	Cutting
Protein	50	13.9	13.0	12.1	11.5	13.4	12.8
	75	14.2	13.9	12.4	12.1	13.7	13.4
	100	14.3	14.0	12.5	12 2	13.9	13.7
	125	14.7	14.4	12.7	12.5	14.0	13.9
	150	15.8	15.2	13.0	12.7	14.4	14.3
Ash	50	1.5	1.3	1.7	1.3	1.9	1.5
	75	1.5	1.1	1.5	1.3	1.8	1.4
	100	1.3	1.1	1.5	1.2	1.7	1 4
	125	1.1	1.0	1.5	1.3	1.6	1.3
	150	0.9	0.9	1.3	1.1	1.6	1.2
Oil	50	1.2	0.9	1.5	1.4	1.0	0.8
	75	1.5	1.1	1.6	1.4	0.9	0.7
	100	1.5	1.2	1.5	1.5	0.9	0.9
	125	1.6	1.2	1.7	1.5	1 0	0.9
	150	1.7	1.3	1.8	1.6	1.2	1.1
Fiber	50	2.4	2.2	2.6	2.2	2.9	2.7
	75	2.3	2.0	2.4	2.1	2.7	2 5
	100	2.1	2 0	2 3	2.3	2 7	2.4
	125	2.2	2.1	2 3	2 1	2 4	2 3
	150	2.0	2.2	2.0	2.0	2.3	2 1
Total carbohydrates	50	81.0	82.6	82.1	83.6	80.8	82 2
	75	80.5	81.9	82.1	83.1	80 9	82.0
	100	80.8	81.7	82.2	82.8	80 8	81.7
	125	80 4	81.3	81.8	82.6	81 0	81.6
	150	79.6	80.4	81.9	82.6	80.5	81.0

* Mean data from three replicates for tow seasons.

Physical properties of wheat grains:

Table (8) shows the effect of fertilization with different levels of nitrogen with and without cutting on physical properties (hectoliter and extraction ratio) of wheat grains (Sides 1, Giza 168 and Gemmeiza 9 varieties) with respect to hectoliter. Sides 1 gave the highest values, compared with other varieties. Data revealed that increasing N levels, and cutting increased hectoliter.

Table (8): Effect of single clipping on physical properties of wheat grain under different nitrogen levels.

	kg N/fed	Sids 1		Giza 168		Gemmeiza 9	
		Control	Cutting	Control	Cutting	Control	Cutting
Hectoliter	50	82.9	83.8	80.0	82 6	82 7	83 0
	75	83.0	84 3	81 2	83.0	82.8	83.4
	100	83 6	84 9	82 0	83 9	83 0	83 9
	125	84.0	85.1	82.2	84 1	83.8	84 2
	150	84.5	85.5	83.0	84 3	84 2	84.5
Flour extraction (%)	50	65.5	66 5	61.8	64 0	62.0	65.1
	75	65.8	67.8	62.7	66.1	62.8	67 0
	100	66.5	69.0	63.0	67.0	63.1	67 5
	125	69 0	70 2	63 7	67 3	64.2	68 1
	150	69.4	70.8	64.4	67.9	65.0	68 8
Bran extraction (%)	50	29.1	26.8	32.9	29.4	32 8	28 6
	75	28.4	25.4	31.8	27 2	31 8	26 5
	100	27.6	23 0	31.1	26.1	31.4	25 5
	125	24.8	22.7	30.3	25.7	30.1	24.9
	150	24.2	21.8	29.3	24.9	28.9	23.9
Short extraction (%)	50	5.4	6.7	5.3	6.6	5 2	6.3
	75	5.8	6.7	5.5	6.7	5.4	3.5
	100	5.9	7.0	5.9	6.9	5 5	7.0
	125	6.2	7.1	6.0	7 0	5 7	7.0
	150	6.4	7.4	6.3	7 2	6.1	7.3

*** Mean data from three replicates for tow seasons.**

Regarding extraction ratio, flour percentage increased by increasing N levels and cutting. The data ranged from 65.5% to 70.8%, 61.8% to 67.9% and 62.0% to 68.8% for the three varieties (Sids 1, Giza 168 and Gemmeiza 9), respectively. This indicates that variety Sids 1 gave the highest ratio of flour. The same trend was shown with short percentage. On the other hand, bran percentage decreased by increasing N levels and cutting. Sids 1 gave the lowest value of bran compared with other varieties.

From the above-mentioned data, it could be concluded that increasing N rates and cutting increased hectoliter, flour and short percentage, whereas bran percentage decreased. On the other hand, variety Sids 1 gave the highest value of flour and lowest value of bran compared with other varieties.

Farinograph properties and gluten content:

Table (9) shows the effect of fertilization with different levels of nitrogen with and without cutting on farinograph properties and wet and dry gluten. The data indicated that increasing N levels increased wet and dry gluten. This result was in agreement with those obtained by Pomeranze (1988) who reported that protein and gluten content take parallel trend. Also, cutting caused decreasing in the wet and dry gluten content. This data was parallel with protein content. Concerning the effect of variety on gluten content, it could be noticed that Sides 1 gave the highest value of dry and wet gluten, followed by Gemmeiza 9 then Giza 168. This is due to protein content and protein quality. Regarding farinograph properties, application of 150 kg N/fed gave the highest value of water absorption , mixing time and stability in all varieties compared with 50, 75, 100 and 125 kg N/fed. On the other hand, weakening gave the highest value at 50 kg N/fed., then decreased by increasing N level from 75 to 150 kg N/fed. Water absorption is generally recognized to be affected by protein content, but mixing time and stability can be used as indicator of protein strength (Yamamoto *et al.*, 1996 and Pechanek *et al.*, 1997).

Cutting recorded the lowest values of water absorption, mixing time and stability, and recorded the highest values of weakening. These data were in parallel with protein and gluten content. Also, it could be noticed that the highest values of water absorption and stability were in Sides 1 variety compared with the other varieties.

The data mentioned above revealed that increasing N levels resulted in increasing gluten content (wet and dry), water absorption, mixing time and stability, and decreased the weakening. On the other hand, cutting caused decreasing in gluten content, water absorption, mixing time and stability and caused increasing in weakening. Also, the variety Sides 1 was the best one of gluten content and farinograph properties.

Table (9): Effect of single clipping on farinpgraph properties and gluten content of wheat grain under different nitrogen levels.

	kg N/fed	Sids 1		Giza 168		Gemmeiza 9	
		Control	Cutting	Control	Cutting	Control	Cutting
Wet gluten	50	30 9	29.9	22.4	18.3	24 3	20 0
	75	32.2	30.7	24.9	19.2	24.9	22 3
	100	33.8	31 2	25 5	19.8	26.4	23.8
	125	34.2	31.7	26.4	20.4	26 7	24.3
	150	34.9	34 4	27.6	24 0	27.7	25 9
Dry gluten	50	12 7	11 5	8.7	7 0	9 9	8 5
	75	13.6	12 4	9 6	7 6	10 5	8 9
	100	14.1	13.2	10 3	8.0	10.9	9.5
	125	14.9	13.6	10.8	8.3	11.0	9.8
	150	15.2	14.9	11 2	10 1	11.4	10 5
Water absorption (%)	50	72.0	71.8	64.7	64 4	65.2	64 5
	75	72.2	72.0	65.6	65.0	65.8	65 2
	100	73.0	72.6	66 0	65.6	66.0	65 6
	125	73.6	73.0	66.2	65.9	66 4	66 0
	150	74.6	73.2	67.0	66.4	67.1	66 8
Mixing time (minute)	50	3.00	2 50	1.00	0.75	1.25	1 25
	75	3.25	3 00	1 00	1.00	1.25	1.25
	100	3.25	3.00	1.25	1.00	1 25	1.50
	125	3.50	3.25	1.50	1.25	1 50	1 50
	150	4.00	3 50	1.50	1.50	1 50	1 50
Stability (minute)	50	3.25	3.00	1 25	1.00	1.25	1 00
	75	3.50	3.25	1.25	1.00	1.50	1 25
	100	4.50	4.00	1.50	1.25	1.75	1.25
	125	4.75	4.50	1.50	1 50	1 75	1.50
	150	5 00	4.75	1.75	1 50	2 00	1.50
Weakening (B.U.)	50	140	160	240	260	240	250
	75	130	150	230	250	220	230
	100	120	140	220	230	210	220
	125	100	110	210	220	200	205
	150	90	100	200	210	180	190

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تأثير الحش مرة واحدة على مكونات المحصول والصفات الكيماويــة والطبيعيــة والتكنولوجية لبعض أصناف القمح تحت مستويات مختلفة من التسميد الأزوتى

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أقيمت تجربتين حقليتين في منطقة البستان (غرب الدلتا) في موسمي ٢٠٠٢/٢٠٠٣ و ٢٠٠٣/٢٠٠٤ بهدف إجراء الحش مرة واحدة لمحصول القمح للحصول على محصول العلف في وقت الشتاء وذلك بهدف زيادة القيمة الاقتصادية للقمح . تم زراعة ثلاثة أصناف من قمح الخبز (سدس ١، جيزة ١٦٨، جميزة ٩) تحت خمسة معدلات من التسميد الأزوتى (٥٠، ٧٥، ١٠٠، ١٢٥، ١٥٠ كجم/فدان) وقد أجرى الحش بعد ٤٥ يوم من الزراعة على ارتفاع ٧-١٠ سم من سطح الأرض. أوضحت النتائج حدوث انخفاض معنوي في محصول الحبوب بتأثير الحش من ١٣,٧ إلى ١٢,٤ ، من ١٤,٩ إلى ١٣,٩ إردب/فدان في كلا من موسمي الزراعة، في حين كان الانخفاض في مكونات المحصول بتأثير الحش غير معنوى في الموسمين. وقد انخفض محصول العلف الجاف في موسمي الزراعة وذلك بانخفاض معدل التسميد النيتروجينى. وقد تفوق صنف جميزة ٩ في محصول العلف الجاف أما الصنف سدس ١ فكان اقلهم في محصول العلف وذلك في الموسمين.

وقد أدى الحش إلى انخفاض في التحاليل الكيماوية للأصناف (عدا الكربوهيدرات الكلية) وكذلك الجلوتين الرطب والجاف وخواص الفارينوجراف (نسبة امتصاص الماء، مدة الخلط، الثبات). ومن ناحية أخرى فقد أدت زيادة معدلات التسميد النيتروجينى إلى زيادة في نسبة كلا من البروتين والزيت وكذلك نسبة الاستخلاص والجلوتين الرطب والجاف وثبات العجين، في حين أدت زيادة التسميد النيتروجينى إلى انخفاض في محتوى الحبوب من الرماد والألياف والكربوهيدرات الكلية وكان أفضل أصناف القمح هو سدس ١ لاحتوائه على أعلى نسبة من البروتين وكذلك ارتفاع نسبة الاستخلاص وثبات العجين ، يليه الصنف جميزة ٩ ثم جيزة ١٦٨.