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SALIENT FEATURES OF MIXED FARMING SYSTEM IN NEWLY RECLAIMED LAND IN EGYPT

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SUMMARY

This study was carried out at Al-Entilak sector located at Nubaria area, El-Beheira governorate, Egypt. The objectives were to characterize the crop-livestock production system and determine the technical coefficients of crop and animal production. Four villages were identified which will be referred to as sites 1, 2, 3 and 4, respectively. A questionnaire was designed to cover all the available resources of animal and crop production. A random sample of 162 farms was taken and a field survey was conducted and data on the agricultural year 2002 /2003 were collected. The data were analyzed by the least squares technique. The overall means of family and herd size were 7.5 person/farm and 2.9 head/farm. Results showed that 70% of the farms kept buffaloes and/or cows in mixed herds. Family consumed 42% of buffalo milk and 31% of cow milk. The overall average of total milk yield for buffaloes was 1970 Kg during a lactation period of 229 days. Crossbred cows produced 1655 Kg during a lactation period of 223days as an overall average. Baladi cows produced 845 Kg in 165 days. The farmers cultivated about one-third of their farm with berseem in winter and about one quarter of their farm with darawa in summer. Groundnuts were the main source of cash, and farmers consumed only 5% of the crop, while 95% of production went to the market. Farmers consumed 10% of wheat and 90% of wheat production was sold in the village market.

Keywords: mixed farming system, newly reclaimed land, Egypt

INTRODUCTION

The mixed farming system is a traditionally integrated system and is the dominant agricultural system in Egypt which includes about 95% of the cattle and buffalo population, and produces about 75% of the total domestic milk output in Egypt (Abdel-Aziz and Sadek, 2000). This system is characterized by small holdings and herds (1-5 head/farm) of low-producing native animals, low values of inputs and outputs and labor intensive operations using simple techniques and practices.

The farmers' families are the principal consumers of the milk, and therefore, the contribution of this system to the regular milk market does not match its large size. Improving this system will do much for the economic well being of farmers. Few studies applied the system approach to study production system in Egypt (Abdel-Aziz, 1994 and 1997 and Ahmed, 1995 and Al-Sheikh, 2002).

The main objectives of the present study were to: (1) characterize the current

farming system in the newly reclaimed area of Al-Entilak Sector, Nubaria area, El-Beheira governorate, Egypt; and (2) determine the technical coefficients of crop and animal production under the current farming system.

MATERIAL AND METHODS

Study Area

This study was carried out at Al-Entilak sector, as a new desert reclaimed land. Al-Entilak is located in Nubaria area, El- Beheira governorate in the west of Nile Delta, 107 km North West of Cairo, Egypt. The total cultivated area in Al-Entilak sector is about 75 thousand feddans. Thirty seven thousand five hundred feddans are owned and managed by traditional farmers, co-operatives and retired public companies employees and a similar area are owned and managed by university graduates. It contains 16 villages.

Four villages with respect to major farming schemes were identified to be the area of the study. The villages are Al-Emam Malek, Al-Sedeek Yuosef, Al-Tabarany, and Al-Houda and Al-Taqwa, which will be refered to as sites 1, 2, 3 and 4, respectively. The settlers are mainly traditional farmers. All farmers operate mixed farming where livestock and crop activities are practised.

Data

A field survey for the target area was conducted and data on the agricultural year 2002 -2003 were collected. A random sample of 162 farms was taken in sites 1, 2, 3 and 4. Weekly visits were carried out to identify variables and constraints, which would be included in a questionnaire in addition to available resources for animal and crop production in the study area. The collected data included the following variables; 1) production resources **(**farm size, family size, herd size, herd composition, manpower, water resources, types of irrigation and mechanization); 2) animal production activities (daily milk yield, lactation period and total milk yield); and 3) crop production (cultivated area, cropping pattern, main crops yield and by-product yield).

Statistical Analysis

The data were analyzed by the least squares technique using the general linear models procedure of SAS (1998). Two different statistical models were used:

Model (1)

This model was adopted to estimate the technical coefficients of the animal production traits:

$$y_{ijkl} = \mu + a_i + b_j + c_k + (ab)_{ij} + (abc)_{ijk} + e_{ijkl}$$

where, y_{ijkl} is the observation, μ is the general mean, common element to all observations in the population, a_i is the effect due to the i^{th} site,i=1,2,3,4, (1= El Emam Malek, 2= El Sedeek Youssif, 3 = El Tabarany and 4 = El Hoda and El Takwa), b_j is the effect due to the j^{th} genotype, j=1,2,3, (1=buffaloes, 2=crossbred cows, and 3=native cows), c_k is the effect due to the k^{th} source of animal, k=1,2, (1= Central Fund for Animal Wealth Development "CFAWD", 2= village market), $(ab)_{ij}$ is the interaction between i^{th} site and j^{th} animal genotype, $(abc)_{ijk}$ is the

interaction between i^{th} site, j^{th} animal genotype, and k^{th} source of animals, and e_{ijkl} is the random error.

Model (2)

To derive the technical coefficients for crop production, the following linear model was used:

$y_{ijk} = \mu + a_i + b_j + (ab)_{ij} + e_{ijk}$

where, y_{ijk} is the observation, μ is the general mean, common element to all observations in the population, a_i is the effect due to the i^{th} site, i=1,2,3,4, (as mentioned in model 1), b_j is the effect due to the j^{th} crop type, j= 1, 2, 3, 4 (1= wheat, 2= berseem, 3=groundnut, and 4= darawa (fodder maize)), $(ab)_{ij}$ is the interaction between i^{th} site and j^{th} crop type and e_{ijk} is the random error.

RESULTS AND DISCUSSION

1. Characterization of current farming system

1.1. Farm and herd size

The average farm size in all the studied sites was 2.5 feddan/farm. The overall means of family and herd size were 7.5 person/farm and 2.9 head/farm, respectively. The herd size reflects the traditional small holding of the small farmer in the mixed farming system in Egypt. The overall means of per-capita of farm and herd size were equal 0.3 feddan/person and 0.3 head/person, respectively. The increase in per-capita of farm size in sites 3 and 4 is due to the decrease in family size, where the farm size was constant in all sites. Per-capita of herd size in sites 3 and 4 was higher than those of sites 1 and 2, which is due to the increase of cattle and buffalo holders and the decrease in family size.

1.2. Manpower

Human power is divided into two main classes, family and hired labor. The family labor is used within the house and on the farm, and can be employed elsewhere. Hired agricultural labor (casual and permanent) comes mainly from the neighboring areas of Menofia and Beheira governorates.

1.3. Mechanization

Most of farmers owned tractors, vehicles, water pumps and sprinklers. These equipment are used in preparing the soil for cultivation. The harvesting machines are available for rent from the local agricultural cooperatives.

1.4. Water resources and irrigation system

The irrigation water is mainly obtained from El-Bustan canal, which comes from El-Beherie branch of the Nile. The common irrigation system is the sprinkler system in all sites studied.

1.5. Livestock resources

The Central Fund of Animal Wealth Development (CFAWD) has an important role in developing the animal production in the newly reclaimed land in Egypt. The CFAWD provided good and high yielding animals to the traditional farmers and the university graduates with soft loans to develop the current farming system. The percentage of cattle and buffaloes provided by the CFAWD ranged from 33% to 42% of the herd size, respectovely. The number of buffaloes distributed by the CFAWD as a percentage of the total owned buffaloes varied between 45% (site 4) and 90% (site 1). CFAWD has also an important role in providing farmers with small ruminants in

the newly reclaimed land. The contribution of the CFAWD ranged from 25% (site 4) to 32% (sites 1 and 2). The total number of small ruminants reached about 10 heads/farm in site1. The average poultry flock size ranged between 15 and 74 bird/farm, with an overall mean of 42 bird/farm.

Three types of herds were identified according to their composition: cattle-herds, buffalo-herds and mixed herds, which include both cattle and buffalos. Results showed that 70% of the farms contain mixed herds. There is an obvious tendency of farmers to keep buffaloes as their main dairy animals. Abdel-Aziz and Sadek (2000) mentioned that about 60% of the farmers have mixed herds of cattle and buffaloes in a survey of eight villages in four leading livestock governorates in the Nile Delta and in the new lands. Estimates of field survey of the current system is higher than those reported by Ahmed (1995) in Tahrir province.

1.6. Cropping pattern

The major winter crops are wheat and Egyptian clover (berseem), while groundnuts and darawa are the main summer crops. The results of the field survey showed that farmers in the sample in this study cultivated wheat as the major winter cash crop. The percentage of the average cultivated area of wheat was 60%, the values ranged from 54% (site 1) to 65% (site 4). Groundnut represents the major summer cash crop in this study, where 100% of the farmers in site 1,3 and 4 cultivated about 80% of their farm size with this crop.

The percentage of farmers interested in cultivating berseem was 92. They cultivated about one-third of their farm size (35%). In summer, the farmers allocated about one quarter of their farm size for green fodder (darawa). These results are in agreement with the findings of Ahmed (1995), Abdel-Aziz (1989), Ahmed *et al*. (2000), and Abdel-Aziz and Sadek (2000).

1.7. Consumption and marketing

Results of the field survey showed that family consumed 42% of buffalo milk and 31% of cow milk where the remainder is sold to middlemen at a low price in the village market as fresh or processed products. The increase in family consumption of buffalo milk, as compared to cow milk, in all studied sites may be due to its high fat content, which is preferable for butter, ghee and cottage cheese processing.

Abdel-Aziz and Sadek (2000) stated that the percentage of family consumption of milk in a sample of 339 small farms in Egypt was 61%. The sold fresh milk was only 2%, and the processed milk was 37% of the total milk production.

As for field crops , groundnut represents the main source of cash, and farmers consumed only 5%, where 95% of production went to the market. Farmers consumed 10% of wheat to cover household needs in preparing bread while 90% is sold in the village market.

1.8. Management Practices

Animals were housed in small enclosures connected to the family house. Animals were taken care of by family labor, mainly women. In most cases cows and female buffaloes were served naturally with bulls available in the village. Matings were arranged in such a way that cows and buffaloes would calve within the clover (berseem) season (October-May). Animals were hand milked twice daily. Live animals were sold when cash is needed, or when they were due for culling. Buffalo male calves are sold for slaughter at a very young age to save their dams' milk mainly for family consumption. Berseem or Egyptian Clover (*Trifolium alexandrinum*) was the main source of feeding in winter. In summer, animals were fed on fodder maize,

wheat straw, sorghum stalks and by-products of other crops in addition to some concentrates purchase from the market. Produced manure was transferred from the barn to the field by means of draft animals or tractors.

2. Technical Coefficients

2.1. Animal production

Least squares means and standard errors of total milk yield (TMY), lactation period (LP) and daily milk yield (DMY) of buffaloes, crossbreds and native cattle are presented in tables 1, 2 and 3 in respective order.

Table 1. Least squares means[1] ($\overline{X}$) and standard errors (±SE) of milk production traits of buffaloes

Trait		Overall mean (162)*	Site 1 (50)*		Site 2 (27)*		Site 3 (50)*		Site 4 (35)*	
			CFAWD	Market	CFAWD	Market	CFAWD	Market	CFAWD	Market
TMY (kg)	$\overline{X}$	1970	2350^{a}	2065^{b}	1725^{c}	1385^{cd}	2000^{b}	1600^{c}	1975^{b}	1675^{c}
	±SE	24	84	54	76	102	41	124	70	96
LP (month)	$\overline{X}$	7.5	8.6^{a}	8.4^{ab}	7.8^{c}	7.9^{c}	8.2^{b}	7.4^{d}	7.4^{d}	7.4^{d}
	±SE	0.05	0.19	0.12	0.17	0.23	0.09	0.28	0.16	0.21
DMY (kg)	$\overline{X}$	7.4	8.9^{a}	8.1^{b}	7.3^{d}	5.8^{e}	8.0^{c}	7.2^{d}	8.6^{ab}	7.4^{d}
	±SE	0.09	0.29	0.19	0.27	0.36	0.15	0.44	0.25	0.34

* No. of farms Site 1= El Emam Malek, Site 2= El Sedeek Youssif, Site 3 = El Tabarany, Site 4 = El Hoda and El Takwa
TMY = Total milk yield (kg)., LP = Lactation period (month)., DMY = Daily milk yield (kg)., CFAWD = Central Fund for Animal Wealth Development, 1= within the same raw means not followed by the same letters differ significantly at the 5% level.

Table 2. Least squares means[1] ($\overline{X}$) and standard errors (±SE) of milk production traits of crossbred cows in the studied area*

Trait		Overall mean (162)*	Site 1 (50)*		Site 2 (27)*		Site 3 (50)*		Site 4 (35)*	
			CFAWD	market	CFAWD	market	CFAWD	market	CFAWD	Market
TMY (kg)	$\overline{X}$	1655	1655^{c}	1640^{c}	--	2930^{a}	--	1325^{d}	1815^{b}	1825^{b}
	±SE	25	72	44		102		45	215	60
LP (month)	$\overline{X}$	7.3	7.5^{ab}	7.6^{ab}	--	8.0^{ab}	--	6.8^{d}	7.0^{bcd}	7.6^{ab}
	± E	0.06	0.16	0.09		0.23		0.09	0.48	0.13
DMY (kg)	$\overline{X}$	7.3	7.2^{cd}	7.1^{cd}	--	12^{a}	--	6.4^{d}	8.5^{bc}	7.9^{bc}
	±SE	0.09	0.25	0.15		0.36		0.16	0.76	0.21

* No. of farms Site 1= El Emam Malek, Site 2= El Sedeek Youssif, Site 3= El Tabarany, Site 4= El Hoda and El Takwa
TMY = Total milk yield (kg)., LP = Lactation period (month). , DMY = Daily milk yield (kg).
CFAWD = Central Fund for Animal Wealth Development.
1= within the same raw means not followed by the same letters differ significantly at the 5% level.
* No crossbreed cows were provided by the CFAWD in sites 2 & 3.

Table 3. Least squares means[1] ($\overline{X}$) and standard errors (±SE) of milk production traits of Baladi cows in the studied sites[2]

Trait		Overall Mean (162) *	Site 2 (27)*		Site 4 (35) *	
			CFAWD	Market	CFAWD	Market
TMY (kg)	$\overline{X}$	845	810[a]	730[a]	--	260[b]
	±SE	52	92	92		124
LP (month)	$\overline{X}$	5.4	5.9[a]	4.6[b]	--	6.7[c]
	± SE	0.11	0.20	0.16		0.28
DMY (kg)	$\overline{X}$	5.4	5.1[a]	5.3[a]	--	6.2[a]
	± SE	0.18	0.33	0.25		0.44

* No. of Farms. 1 = El Emam Malek, 2 = El Sedeek Youssif, 3 = El Tabarany, 4 = El Hoda and El Takwa.
TMY= Total milk yield (kg). LP= Lactation period (month). DMY= Daily milk yield (kg).
CFAWD = Central Fund for Animal Wealth Development
1= Within the same raw means not followed by the same letters differ significantly at the 5% level, 2= Baladi cows were not found in sites 1 and 3, and no Baladi cows were provided by the CFAWD in site 4.

The overall average of TMY for buffaloes was 1970 kg during a lactation period of 229 days. This estimate of TMY is higher than most figures reported on buffaloes in Egypt. Reviewed estimates obtained from state and experimental farms were listed by Abdel-Aziz and Hamed (1979, 1970 kg), Mostageer *et al*. (1981, 1230 kg), Nigm *et al*. (1986, 1250 kg), Abdel-Aziz (1993, 1250 kg), and Ahmed (1995, 1120 kg).

In the present study, buffaloes provided by the CFAWD have significantly ($P<0.05$) more TMY and DMY than those coming from market. This is due to the role of CFAWD in selecting and distributing 500 of high yielding buffaloes through the Italian project for improving buffaloes.

Crossbred cows produced 1655 kg during a lactation period of 223 days as an overall average. No significant differences were found between cows from market and those distributed by CFAWD. The estimates obtained in this study are comparable with the estimates published by Winrock International (1993) of 1600 kg under small farms conditions. Ahmed (1995) stated lower estimate of 1250 kg for crossbred cattle under the crop-livestock production system in El-Tahrir Province.

Under the current mixed farming system, Baladi cows produced 845 kg in 165 days, with an average of 5.5 kg for DMY. No significant differences were found between cows from market and those distributed by CFAWD. Although this estimate is low, it is higher than those stated by Nigm *et al*. (1986) of 640 kg , Winrok International (1993) of 640 kg and Ahmed (1995) of 750 kg under small farm conditions. The analysis of variance showed that site, genotype and source of animal had significant effect ($P<0.05$) on all the traits studied.

2.2. Crop production

Least squares means for crop area and total farm production of the major crops (wheat, Berseem, groundnut, and darawa) are presented in table 4. Farmers cultivated about 60% of their farms with wheat in winter and about 75% with groundnuts in summer. Farmers in site 2 produced the highest production of wheat and berseem despite their cultivated area was not the largest. This may be due to the difference in the experience of management practices (crop rotation, seeding rate and fertilization).

Table 4. Means[1] ($\overline{X}$) and standard errors (SE) of crop area and total farm crop production for the main crops in the studied sites

Crop	Overall mean (162)*	Site 1 (50)*		Site 2 (27)*		Site 3 (50)*		Site 4 (35)*	
	$\overline{X}$	$\overline{X}$	SE	$\overline{X}$	SE	$\overline{X}$	SE	$\overline{X}$	SE
Wheat:									
Crop area (feddan)	1.5	1.5^{a}	0.03	1.4^{b}	0.04	1.3^{c}	0.03	1.6^{d}	0.4
Production (Ardab)	20.0	21.3^{a}	0.4	22.0^{b}	0.6	15.3^{c}	0.4	21.5^{d}	0.8
Berseem:									
Crop area (feddan)	0.9	1.0^{a}	0.03	0.8^{b}	0.04	1.0^{a}	0.03	0.9^{c}	0.03
Production (Ton)	17.8	17.4^{a}	0.6	19.2^{b}	0.4	17.2^{a}	0.4	17.4^{a}	0.5
Groundnut:									
Crop area (feddan)	1.9	2.0^{a}	0.03	1.6^{b}	0.04	2.0^{a}	0.03	1.9^{c}	0.03
Production (Ardab)	26.0	26.0^{a}	0.4	21.0^{b}	0.6	29.0^{c}	0.4	27.8^{d}	0.5
Darawa:									
Crop area (feddan)	0.6	0.5^{a}	0.03	0.7^{b}	0.04	0.5^{a}	0.03	0.6^{c}	0.05
Production (Ton)	18.8	16.4^{a}	0.4	20.0^{b}	0.6	18.8^{c}	0.4	19.9^{d}	0.8

Ardab of wheat = 150 kg . Ardab of groundnut = 75 kg . Feddan = 4200 M^2.
*No. of Farms , Site 1 = El Emam Malek, Site 2 = El Sedeek Youssif, Site 3 = El Tabarany, Site 4 = El Hoda and El Takwa, 1 = within the same raw means not follow by the same letter differ significantly at the 5% level.

Technical coefficients of cash crop production included outputs and inputs. The output components of the cash crops are the main product and by-product. The input elements are labor, mechanical power, chemical and organic fertilizers, seeds and pesticides. Least squares means of inputs and outputs per feddan for the main crops studied are presented in tables 5, 6, 7 and 8.

Table 5. Technical coefficients of wheat crop per feddan in the studied area

	Unit	Overall Mean	Site 1 $\overline{X}$	SE	Site 2 $\overline{X}$	SE	Site 3 $\overline{X}$	SE	Site 4 $\overline{X}$	SE
N*		162	50		27		50		35	
Output:										
Main product (grains)	Ardab**	8	8.5	0.33	8.8	0.45	6.1	0.33	8.6	0.39
By product (straw)	Heml ***	5.8	6.4	0.13	5.9	0.17	4.9	0.13	5.4	0.15
Inputs:										
Labor	Man/day	4.6	6	0.11	3	0.15	3.7	0.11	5.5	0.13
Mechanical power	Hour	3.7	3.4	0.09	3	0.12	3.2	0.09	4.7	0.11
Chemical fertilizer:										
Nitrogen	Kg	438	420	9.54	452	12.9	376	9.6	500	11.4
Phosphorus	Kg	189	202	6.16	258	8.4	152	6.2	151	7.4
Potassium	Kg	93	54	3.31	194	4.5	74	3.4	50	3.9
Manure	m3	16	16	0.45	15	0.61	11	0.45	20	0.54
Seeds	Kg	33	31	0.56	31	0.76	30	0.56	38	0.67
Pesticides	LE	53	35	6.86	104	4.7	26	5.2	48	4.2

* No. of Farms **Ardab of wheat = 150 Kg ., Ardab of groundnut = 75 kg . *** heml = 250 kg ., Feddan = 4200 M^2. Site 1 = El Emam Malek, Site 2 = El Sedeek Youssif, Site 3 = El Tabarany, Site 4 = El Hoda and El Takwa

Table 6. Technical coefficients of berseem crop per feddan in the studied area

	Unit	Overall mean	Site 1 $\overline{X}$	SE	Site 2 $\overline{X}$	SE	Site 3 $\overline{X}$	SE	Site 4 $\overline{X}$	SE
N*		149	50		15		50		34	
Output:										
Main product	Tons	17.8	17.4	0.33	19.2	1.04	17.2	0.33	17.4	0.39
Inputs:										
Labor	Man/day	2.4	2.2	0.11	2.2	0.34	2.9	0.11	2.2	0.13
Mechanical power	Hour	2.5	2.6	0.09	2.4	0.29	2.8	0.09	2	0.11
Chemical fertilizer:										
Nitrogen	Kg	401	322	9.5	430	30	362	9.9	491	12
Phosphorus	Kg	175	138	6.2	260	20	152	6.2	152	7.5
Potassium	Kg	60	46	3.3	90	11	53	3.3	50	4.01
Manure	m^3	15	17	0.45	11	1.4	13	0.45	20	0.55
Seeds	Kg	20	21	0.56	16	18	21	0.56	22	0.68

* No. of Farms Feddan = 4200 M^2.
Site 1= El Emam Malek, Site 2= El Sedeek Youssif Site, 3= El Tabarany, Site 4 = El Hoda - El Takwa

Table 7. Technical coefficients of groundnuts crop per feddan in the studied area

	Unit	Overall mean	Site 1 $\overline{X}$	SE	Site 2 $\overline{X}$	SE	Site 3 $\overline{X}$	SE	Site 4 $\overline{X}$	SE
N*		151	49		17		50		35	
Output:										
Main product	Ardab**	10.4	10.4	0.33	8.4	0.88	11.6	0.33	11.1	0.39
By product	Truck***	1.9	2.0	0.13	2.1	0.34	1.5	0.13	1.2	0.15
Inputs:										
Labor	Man/day	4.5	5.5	0.11	3.6	0.26	3.7	0.11	5.1	0.13
Mechanical power	Hour	3.5	4.2	0.09	3.1	0.24	3.2	0.09	3.5	0.11
Chemical fertilizer:										
Nitrogen	Kg	451	456	9.6	379	26	465	9.5	503	11
Phosphorus	Kg	288	245	6.2	250	17	268	6.2	150	7.4
Potassium	Kg	89	71	3.3	136	8.8	97	3.4	50	3.9
Manure	m^3	16	18	0.46	15	1.2	12	0.45	20	0.54
Seeds	Kg	36	35	0.57	35	1.5	38	0.56	35	0.67
Pesticides	LE	80	59	6.6	80	11	60	4.9	119	4.1

* No. of Farms **Ardab of wheat = 150 Kg ., Ardab of groundnut = 75 kg .
*** Truck = 250 kg Feddan = 4200 M^2.
Site 1= El Emam Malek, Site 2= El Sedeek Youssif Site, 3= El Tabarany, Site 4 = El Hoda - El Takwa

Table 8. Technical coefficients of darawa crop per feddan in the studied area.

	Unit	Overall mean	Site 1 $\overline{X}$	SE	Site 2 $\overline{X}$	SE	Site 3 $\overline{X}$	SE	Site 4 $\overline{X}$	SE
N*		136	50		12		24		50	
Output:										
Main product	Tons	18.8	16.4	0.33	20	1.7	18.8	0.33	19.9	0.23
Inputs:										
Labor	Man/day	2.8	3.1	0.11	3	0.53	2.9	0.11	2.1	033
Mechanical power	Hour	2.5	3.2	0.09	3.5	0.46	2.8	0.09	2.1	0.15
Chemical fertilizer:										
Nitrogen	Kg	346	306	9.5	375	48	297	9.5	407	0.2
Phosphorus	Kg	183	136	6.2	275	31	143	6.2	150	0.17
Potassium	Kg	67	43	3.3	125	17	51	3.3	50	18
Manure	m^3	14	12	0.45	15	2.3	11	0.45	20	12
Seeds	Kg	28	30	0.56	27	2.8	32	0.56	24	6.3

* No. of Farms Feddan = 4200 M^2.

Site 1= El Emam Malek, Site 2= El Sedeek Youssif Site, 3= El Tabarany, Site 4 = El Hoda - El Takwa

Comparison of the different inputs used for different crops revealed that there were remarkable differences in the input levels. Site 1 used higher level of labor in all crops compared to the other sites. One of the explanation is the relatively abundant family labor in site 1 (family size was 8.4 person/farm).

Mechanical power used per feddan for each crop differed from site to site and within the same site from one crop to another. No trend was found in using chemical fertilizer in all sites for different crops.

Farmers in sites 1 and 3 used more quantities of seeds per feddan in wheat and groundnuts than the other two sites, respectively. Farmers in site 4 used more quantities of manure per feddan for all crops studied.

The wheat production per feddan in site 3 was the lowest (6.1 ardab, 1 ardab = 150 kg wheat) compared with that in other sites. This may by due to that farmers of site 3 used less quantities of organic and chemical fertilizers (Table 5).

Brseem production was (19.2 ton) per feddan in site 2 (Table 6). This value was higher than those of other sites. It could be observed that farmers in site 2 used more quantities of phosphorus and potassium fertilizers compared with the other site farmers.

The overall average of groundnuts production per feddan was 10.4 ardab. The values ranged between 8.4 ardab (1 ardeb = 75 kg groundnuts) (site 2) and 11.6 ardab (Table 7) (site 3). This variation may be attributed to different practices of crop cultivation.

The production of summer green fodder (darawa) per feddan was about 19 ton in all sites. The lowest production was found with site 1, which may be attributed to the lower amount of phosphorus and potassium fertilizers used by farmers (Table 8).

The analysis of variances showed that both site and crop had significant effect ($P<0.05$) on all the studied traits in the four sites.

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السمات البارزة للنظام المزرعى المختلط فى الأراضى حديثة الإستصلاح فى مصر

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أجريت هذه الدراسة بمنطقة الانطلاق بغرب النوبارية بمحافظة البحيرة بهدف توصيف نظام الإنتاج بالمنطقة وتقدير المعاملات الفنية لأداء الإنتاج النباتى والحيوانى.تم إختيار ١٦٢ مزرعة داخل أربع قرى، وأُعدت إستمارة إستبيان لتجميع البيانات عن السنة الزراعية ٢٠٠٢/٢٠٠٣ ، واستخدمت طريقة الحد الأدنى للمربعات لتحليل البيانات . أوضحت النتائج أن متوسط حجم الأسرة و الحيازة الحيوانية ٧.٥ فرد/مزرعة، ٢.٩ رأس/مزرعة ، على الترتيب، وأن ٧٠% من المزارع تحتفظ بالجاموس والأبقار فى شكل قطعان مختلطة .تستهلك الأسرة ٤٢% من اللبن الجاموسى و ٣١% من اللبن البقرى ويباع الباقي بسوق القرية. بلغ المتوسط العام لإنتاج اللبن للجاموس بالمنطقة ١٩٧٠ كجم خلال موسم حليب طوله ٢٢٩ يوماً. بلغ المتوسط العام لإنتاج الأبقار الخليطة من اللبن ١٦٥٥ كيلوجرام خلال موسم حليب ٢٢٣ يوماً، بينما أنتجت الأبقار البلدية ٨٤٥ كيلو جرام لبن خلال موسم حليب ١٦٥ يوماً. يزرع المنتفع نحو ثلث مساحة أرضه بالبرسيم شتاءاً ونحو ربع هذه المساحة بالدراوة صيفاً.يمثل الفول السودانى أهم محصول رئيسي كمصدر للدخل ، حيث يستهلك المزارع ٥% فقط من المحصول ويباع ٩٥% بالسوق . يستهلك المزراعين بالمنطقة ١٠% من القمح ويباع ٩٠% من الإنتاج بسوق القرية.