Table (9) : Effect of intercropping cotton and maize on some agronomic characters and yield components of maize in 1987 and 1988 seasons.

Treatments / Characters	Plant height (cm)		Area of topmost ear leaf (cm^2)		Number of ears/plant		Ear weight (gm)		Weight of 100 kernels (gm)		Grain yield/ plant (gm)		Percentage of barren plants (%)	
Season	1987	1988	1987	1988	1987	1988	1987	1988	1987	1988	1987	1988	1987	1988
Intercropping systems :														
Cotton Maize														
50% + 50%	225.4	170.1	631.43	574.30	1.32	1.10	168.38	159.84	29.29	35.58	221.23	163.10	0.04	0.05
50% + 100%	219.8	154.5	652.46	486.48	1.27	1.13	167.35	159.91	34.37	34.41	211.37	156.76	0.07	0.05
100% + 50%	212.3	170.3	546.88	452.54	1.13	1.04	146.32	139.71	31.03	34.32	164.95	128.47	0.06	0.05
100% + 100%	217.3	164.0	578.82	460.51	1.12	1.06	135.26	135.78	29.06	34.23	150.47	119.40	0.06	0.09
Maize alone	213.6	170.6	555.48	463.22	1.10	1.02	149.69	144.48	31.45	35.48	165.09	138.74	0.09	0.09
L.S.D. 0.05	NS	NS	76.63	45.17	0.11	NS	20.35	NS	1.81	NS	30.06	28.27	NS	0.04
L.S.D. 0.01	NS	NS	NS	63.33	0.15	NS	NS	NS	2.54	NS	42.15	NS	NS	NS

Cotton alone = 70000 plants/fad.

Maize alone = 23333 plants/fad.

was clear that increasing the population density of maize from 50% to 100% of the pure stand density, significantly reduced leaf area.

In the first season, the highest leaf area was recorded under intercropping system 50% : 100% (maize : cotton) which exceeded the pure stand leaf area by 17%.

In the second season, the highest leaf area was of the intercropping system 50% : 50% which was 24% higher than in sole cropping. The increase in leaf area associated with the reduced maize population is mainly due to the decrease in intraspecific competition. It could be concluded that intercropping maize and cotton did not adversely affect area of the topmost ear leaf, moreover an increase in leaf area resulted when intercropping was followed at lower densities.

Results obtained by Hosny et al (1989) indicated that intercropping cotton and maize significantly increased leaf area duration of maize.

3- Number of ears per plant :

Number of ears per maize plant was favourably affected by intercropping in both seasons as shown in Table 9.

In 1987 season, intercropping increased number of ears per plant by 20, 15, 3 and 2%, over pure stand maize, for intercropping systems 50% : 50%, 50% : 100%, 100% : 50% and 100% : 100%(cotton : maize), respectively.

In 1988 season, the increase in ear weight was 11% for the two systems, compared with sole maize growing.

Ear weight in intercropping systems including 100% maize was reduced, compared with sole maize cropping, but the differences were not significant.

The increase in ear weight of maize intercropped at lower maize density is mainly due to the reduced intraspecific competition which is lower than interspecific competition.

Results reported by Abdel-Aal and Mohamad (1988) showed that ear weight in maize was significantly increased when maize was intercropped with cotton.

5- Weight of 100 kernels (gm) :

Results in Table 9, showed that 100-kernel weight in maize was significantly affected by intercropping only in the first experimental season.

In 1987 season, the highest 100-kernel weight was of the intercropping system 50% maize : 100% cotton which exceeded the pure stand maize by 9.3 %. The lowest 100-kernel weight in the first season was recorded with the intercropping treatment 100% : 100% and was significantly lower by 7.7%, compared with the pure stand maize.

In 1988 season, all values of 100-kernel weight were nearly similar with too slight differences. The highest value was for

intercropping system 50% : 50% and the lowest value for intercropping system 100% : 100%.

It could be concluded that 100-kernel weight in maize was favourably affected by intercropping at lower maize density as a result of the reduced intraspecific competition.

Results reported by Abdel-Aal and Mohamad (1988) showed that intercropping maize and cotton significantly increased 100-kernel weight.

6- Grain yield per plant (gm) :

Results in Table 9, showed that grain yield/plant was significantly influenced by intercropping in both seasons. It was clear from the results that grain yield/plant of the intercropping systems including maize at 50% of the normal density outweighted that of intercropped maize at 100% of the normal density, as well as pure stand maize.

In both seasons, intercropping at 50% : 50% produced the highest grain yield/plant which was significantly higher than maize in sole cropping by 34 and 18% in the first and second season, respectively. Also intercropping systemof50% maize : 100% cotton produced higher grain yield/plant, compared with sole cropping by 28 and 13% in 1987 and 1988 season, respectively.

In both seasons, the lowest grain yield/plant was produced by the treatment 100% : 100% which was lower than that of sole cropping by 9 and 14%, in 1987 and 1988 season, respectively.

It could be concluded that maize grain yield / plant was increased by intercropping under lower maize densities due to the increase in intraspecific competition.

It is worth mentioning that grain yield/plant followed the same trend of response of ear weight and weight of 100 kernels to intercropping. Results reported by Abdel-Aal and Mohamad (1987) showed that intercropping maize with cotton increased the yield components of maize as well as grain yield per faddan.

7- Percentage of barren plants :

Results showed that intercropping significantly affected the percentage of barren plants in the second season only (Table 9). In both seasons, maize alone had the highest barren plants percentage, whereas maize intercropped under 50% : 50% system produced the lowest percentage of barren plants.

Results showed that percentage of barren plants was only 0.04 and 0.05 in the 50% : 50% intercropping system, compared with 0.09 and 0.09% in sole maize cropping in 1987 and 1988 season, respectively. In general, barren plants percentage was also increased with the increase in maize population density.

The present resutls indicate clearly that intercropping maize with cotton reduced considerably the percentage of barren plants as a result of a reduced competition among the intercropped maize plants.

Results reported by Abdel-Aal and Mohamad (1988) showed that intercropping maize and cotton positively affected the yield components of maize.

Also, El-Aishy et al (1978) and Galal et al (1983) found that intercropping maize and soybean increased prolificacy in maize plants.

IV- Effect of Intercropping on Maize Grain Yield (kg/fad) and Stand at Harvest :

1- Grain yield (kg/fad) :

Results in Table 10, showed that intercropping significantly affected maize grain yield estimated either as actual yield or adjusted yield per unit area in both growing seasons.

Concerning actual grain yield, results indicated that maize in pure stand significantly outyielded all intercropping systems in both seasons with highly significant differences.

In 1987 season, the actual grain yield of maize for the intercropping systems 50% : 50%, 50% : 100%, 100% : 50% and 100% : 100% was reduced by 31, 33, 26 and 32%, compared with maize yield in pure stand, respectively.

In 1988 season, the reduction in maize grain yield was 33, 38, 11 and 23%, for the four systems, respectively.

Such result is expected since the actual area occupied with maize was only 50% of the pure stand area. It is also clear that doubling maize density increased maize grain yield, compared with the normal population density.

With regard to the "adjusted yield" or maize grain yield per unit area, which is more valid for an accurate evaluation, it was

Table (10): Effect of intercropping cotton and maize on grain yield and percentage of surviving plants at harvest of maize in 1987 and 1988 seasons.

Characters	Grain yield (kg/fad)				Percentage of surviving plants at harvest(%)	
	Actual(+)		Adjusted(++)			
Treatments / Season	1987	1988	1987	1988	1987	1988
Intercropping systems :						
50% + 50%	2839.34	2067.92	5678.67	4135.84	97	95
50% + 100%	2755.06	1922.06	5510.13	3844.12	99	93
100% + 50%	3053.26	2735.61	6106.52	5471.23	70	80
100% + 100%	2813.41	2382.32	5626.81	4764.64	70	76
Maize alone	4116.39	3092.15	4116.39	3092.15	95	84
L.S.D. 0.05	390.73	706.71	510.41	1166.08	13	12
L.S.D. 0.01	547.81	NS	715.60	1634.87	18	17

Cotton alone = 70000 plants/fad.

Maize alone = 23333 plants/fad.

\+ Estimated from yield originally produced per plot.

++ Yield adjusted on unit area basis.