

**RESPONSE OF PEANUT CULTIVARS TO FERTILIZATION AND
.SOWING DATE IN NEW RECLAIMED LAND**

A thesis

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By

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SUMMARY AND CONCLUSION

The present study was carried out in 2006 and 2007 at the Agriculture Experimental Farm of Alexandria University in Bostan area (nearly 100 km east to Alexandria city, latitude 30.2 N, longitude 30.5 N and altitude 7.4m). The main objectives of the recent study were

Studying the response of peanuts local variety "Giza 5" to nitrogen and micro-elements fertilization

Studying the response of peanuts local variety "Giza 6" to sowing dates and biofertilization

Studying the response of peanuts local variety "Giza 5" to sowing dates and biofertilization

The main results of the study will be summarized for each experiment as follows

I: First experiment: Effect of nitrogen rate, methods of application and micro-elements on productivity and quality of "Giza-5" local peanuts variety

The studied treatments included; a) three levels of deep nitrogen fertilization (zero, 30 and 60 kg/faddan) and two doses of micro-elements foliar application i.e. Fe, Zn and Mn (once after 60 days from sowing or twice after 60 and 90 days

from sowing). b) The combinations of three rates of foliar nitrogen fertilization (1, 2 and 3%urea) and two doses of micro-elements foliar application (once after 60 days from sowing or twice after 60 and 90 days from sowing

The experimental lay out was randomized complete block design with four replicates

II. The second experiment: Response of peanuts local variety "Giza 6" to sowing dates and biofertilization

Three sowing dates were used. These were mid-April, mid-May and mid June. Biofertilization was represented by the addition of Halex to seeds prior to sowing. The bacterial strains included in "Halex" were a free N-fixers namely; azotobacter, azosprillium and kleibsella, A split-plot arrangement in a randomized complete block design was used. The main plots were assigned to planting dates, whereas, the sub-plots received two levels of biofertilizer, i.e.; with biofertilizer and without biofertilizer

III: The third experiment: Response of peanuts local variety "Giza 5" to sowing dates and biofertilization

Material and methods for this experiment was completely similar to those of the second experiment except for the

peanuts variety. "Early-punch" an imported early maturing variety adopted under Egyptian condition few years and named Giza-5 was used in this present experiment

Additionally, the following agronomic and yield components and quality traits were evaluated in this study

I. a: Agronomic traits

1. (plant height (cm

2. days to flowering

3. (Green weight and Dry weight per plant (gm

4. days to physiological maturity

5. (Pod yield (kg/faddan

6. (Straw yield (kg/faddan

7. Number of pods/ plant

8. Weight of pods /plant

9. Number of seeds /pods

10. seeds weight /pod

11. seeds weight

12. Oil percentage

13. Protein percentage

The following results were obtained

.I.a.1: Plant height

**kg nitrogen as a deep application with once or twice -
micro-elements spraying would result in the tallest peanuts
.plants**

:I.a.2. Days to flowering

**In 2006 and 2007 seasons, deep fertilization significantly -
delayed DF relative to foliar application (43.94 vs. 43.78 days)
and (44.13 vs. 37.63 days) in the first and second seasons
.respectively**

**Significant delayed in DF was reached by 0 kg nitrogen plus -
spraying twice micro-elements in comparison 0 kg nitrogen
.(plus spraying once micro-elements (38.25 vs. 35 days**

**DF delayed with 30 or 60 kg nitrogen as a deep application -
plus spraying once or twice micro-elements in comparison to
0 kg nitrogen plus spraying once or twice micro-elements
(43.94 vs. 37.75 day) and (44.13 vs. 36.63 day) in the first and
.second season respectively**

Significant delayed in DF was reached by 60kg nitrogen / - faddan as deep fertilization versus 30kg nitrogen (46.3 vs. 42.0 .days) in 2007 season

:I.a.3. Green weight

In 2007 season, deep nitrogen application significantly - increased Gwt relative to foliar application; (386.08 vs. 262.25 .gm) respectively

Deep application of 30 or 60 kg nitrogen / faddan gave high - Gwt in comparison to 0 kg nitrogen / faddan; (386.08 vs. 247.22 gm). Deep fertilization by 60 kg nitrogen significantly increased Gwt in comparison to deep fertilization of 30 kg .(nitrogen (437.37 vs. 335.09 gm

Deep application 30 kg nitrogen plus micro-elements - spraying once or twice and 60 kg nitrogen plus micro-elements spraying once or twice gave the highest Gwt .((unsignificantly a varied from 446.56 to307.89 gm

:I.a.4. Dry weight/plant

Deep application of 60 kg nitrogen plus spraying micro- - elements twice was superior to 60 kg nitrogen plus spraying .(micro-elements once in Dwt by about 17 % (98.9 vs. 96.1 gm

Deep application of 60 and 30 kg nitrogen / faddan - significantly increased Dwt / plant relative to foliar .application (91.57 vs. 60.96 gm) in 2006 season

Deep application of 60 kg nitrogen / faddan significant - increased Dwt in comparison to 30 kg nitrogen / faddan by .about 35% (115.4 vs.85.4 gm) respectively

Deep application of 30 or 60 kg nitrogen surpassed 0 kg - nitrogen in Dwt / plant by about 55% (100.4 vs.64.74gm) for .30 or 60 kg nitrogen and 0 kg nitrogen, respectively

:I.a.5. Days to physiological maturity

Deep fertilization significantly increased days to maturity - relative to foliar application by about 1% (98.13vs.98 days) .in2006 season

In 2006 season, 0 kg nitrogen plus spraying twice micro-- elements delayed days to physiological maturity in

**comparisons to 0 kg nitrogen plus spraying micro-elements
.(once (98 vs,91.25 days**

**urea plus spraying two spraying of micro-elements %\ -
delayed DM in comparisons 1% urea plus one spraying (
101vs.97.5) and (101.25vs. 96 days) the first and second
‘season respectively**

**urea plus spraying two spraying of micro-elements %٢ -
delayed days to physiological maturity in comparisons 2%
.(urea plus one spraying by about (101.75 vs.93.75**

**In 2006 season, 30 or 60 kg nitrogen delayed DPM in -
comparison 0 kg nitrogen (98.13 vs. 94.36days) and
(104.36vs.94.75). Also, 60 kg nitrogen increased DM in
(comparisons 30 kg nitrogen / faddan (101.5 vs. 95 days**

I.b.Yield and yield component

:I.b.1 Pods yield

**In 2007 season, deep fertilization was superior to foliar -
application by about 66% (1359.78 vs. 814.68 kg /faddan),
.respectively**

Deep fertilization 30 or 60 kg nitrogen / faddan surpassed in - pods yield by about 125 % (1359.78 vs. 603.28 kg/faddan) in .comparisons 0kg nitrogen

Deep fertilization of 60 kilogram nitrogen plus spraying - micro-elements twice application gave the highest pods yield in both seasons (1462.65 and 1451.3 kg / faddan) in 2006 and .2007 respectively

:1.b.2. Straw yield

Deep application of nitrogen increased SY relative to foliar - .(application by about 13 % (2536.65 vs. 2250.24 kg /faddan

Also, 30 kg nitrogen plus one sprays of micro-elements was - superior to 30 kg nitrogen plus two sprays of micro-elements in SY by about 9 % (2818.7 vs. 2574.3 kg/ faddan), .respectively

urea plus one spray of micro-elements increased SY in %³ - relative 3% urea plus one sprays micro-elements (1964.2 vs. .(1942.2 kg/ faddan

deep application of 60 kg nitrogen significant increased SY in - .(comparison 30 kg nitrogen (2993 vs. 2696.5kg/ faddan

:l.b.3.Yield component

:l.b.3.1. Number of pods /plant

Deep fertilization of 30 or 60 kg nitrogen significant increased - NP/P in comparison to 0 kg nitrogen by about 60% (30.4 vs. 19) in 2007 season

The lowest NP/P had recorded from zero nitrogen plus - (spraying micro-elements once or twice about (19.0 pod

:l.b.3.4. Seeds weight / pod

Deep fertilization increased significantly ($p \geq 0.01$) seed - weight/pod by about 10% (1.74 vs. 1.62gm) in comparison .foliar method for the second season

:l.b.3.5.100-seeds weight

Deep application of 30 and 60 kg nitrogen with spraying - micro elements twice would result the heaviest 100-seed weight. While, In 2007 season the heaviest 100-seed weight resulted from 60 kg nitrogen plus micro-element spraying

**twice 103.2 gm and 30 kg nitrogen plus micro-elements
.spraying twice 100.3 gm**

:l.c. Quality characters

:(l.c. Oil Percentage (OP

**Deep application was superior to the foliar application in OP -
.by about 4 % (48.67 vs. 46.83 %) in the first season**

**Deep application of 60 kg nitrogen plus two sprays of micro--
element gave high OP 50.97 % in comparison to 60 kg nitrogen
.plus one sprays of micro-elements 45.98 %, in 2007**

**Foliar application of 2% urea increased OP 45.96 % in -
comparison 3% urea 44.48% in 2006 season and 30 or 60 kg
nitrogen superior to 0 kg nitrogen in OP (48.21 vs. 42.95 %) in
.2007 season**

:(l.c.2. Protein Percentage (PP

**Deep application superior to foliar application on PP by -
about 13 %(22.74 vs. 20.13%) and 11% (21.34 vs. 19.31) in the
.first and second seasons, respectively**

Deep application of 60 kg nitrogen significant increased PP - relative to 30 kg nitrogen by about 14 % (24.27 vs. 21.22 %) and 16% (22.89 vs. 119.79 %) for the first and second season, .respectively

Deep application of 30 or 60 kg nitrogen increased PP by - about 23% (22.74 vs. 18.42) and 11% (21.34 vs. 19.23) in comparison 0 kg nitrogen in the first and second seasons .respectively

Deep application of 60 kg nitrogen plus spraying micro-- elements twice surpassed in PP by about 1.5 % (22.62 vs. 22.28%) and 4% (20.9 vs. 20.09%) in comparison 60 kg nitrogen plus spraying micro-elements once in 2006 and 2007 .respectively

II. Experiment II: response of peanuts local variety "Giza 6" to .sowing dates and biofertilization

:II.a.Agronomic characters

:II.a.1 Effect of sowing date

Early sowing date showed superiority in days to flowering, dry weight per plant, number of nodules, and days to physiological maturity in both seasons and plant height in .2007 season

:II.a.2 Effect of biofertilization

Inoculation with "Halex" was superior to non-inoculation by about 35% and 54% in green weight at the first and second season, respectively. Meantime, in 2007, inoculation with "Halex" gave the highest significant dry weight of 43.9 gm. While non-inoculation gave the lowest value of dry weight of .37.3 gm

II.a.3 Effect of the interaction between sowing dates X :biofertilization

The highest values for days to flowering was resulted from April 15th date with inoculation with "Halex" (52.1 and 47.5 gm) for the successive seasons, respectively. While, June 15th X non-inoculation gave the lowest number of days to flowering (39.7 and 37.25) for first and second season, respectively. Also, the highest dry weight was recorded with April 15th at inoculation with "Halex" (51.08gm). Meantime, June 15th date with inoculation gave the lowest dry weight (31.29 gm).from table 23 in 2007; May 15th X inoculation with "halex" gave the heaviest green weight per plant of (331.35 gm). While, May 15th X non-inoculation produced lowest .(values of green weight (150.03gm

:II.b.yield and component

:II.b.1.Pods and straw yield

:II.b.1.1 Effect of sowing date

Pod yield was descending from April 15th (1192.1 kg/faddan) - to May 15th (936.65 kg/faddan) to June 15th (673kg/faddan) in 2006 season

:II.b.1.2 Effect of biofertilization

Inoculation with Halex " surpassed non-inoculation in straw - yield by about 5 % (5115.57 vs4859.83 for inoculated and non-inoculated, respectively

:II.b.2. Yield component

:II.b.2.1 Effect of sowing date

Number of pods in both years was significantly decreasing - (from April 15th (32.75 and 39.63

Significant weight of pods per plant was resulted from May - 15th sowing date (36.22gm) followed by April 15th (33.76gm), (then June 15th (24.49gm

April 15th had the highest number of seeds/pod (1.73). - While, the second rank was represented by May 15th (1.44). On the other hand, the lowest number of seeds per pod resulted from late sowing (June 15th) (1.33), in 2007 season

:II.b.2.2 Effect of biofertilization

Inoculation plus Halex significantly increased the number of - pos per plant by about 20 % (from 44.29 to 37.06), relative to .the non-inoculated treatment. In 2007 season

Inoculation surpassed non-inoculation in 100-seeds weight - by about 8% 94.14 and 87.25) for inoculation and non- .inoculation, respectively

:II.c Quality characters

:II.c.1 Effect of sowing date

April 15th recorded the highest oil percentage of 43.26 % and - 39.97 %, followed by May 15th 41.87 5 and 38.89 % then, June 15th 41.12% and 37.61 % for the first and second seasons, .respectively

The highest protein percentage was noticed from April 15th - (21.3 %), followed by May 15th (19.25%) then, June 15th .(18.58%) in 2007 season

:II.c.2 Effect of biofertilization

**April 15th X inoculation, recorded the highest significant oil -
.and protein percentage**

III. Experiment III: Response of peanuts local variety "Giza 5" .to sowing dates and biofertilization

:III.a.Agronomic characters

:III.a.1 Effect of sowing date

**Early sowing showed significantly increasing of values in each -
of plant height, days to flowering, green weight, dry weight in
the first year and days to physiological maturity in both
.seasons and combined over years**

:III.a.2 Effect of biofertilization

**Inoculation with Halex recorded the maximum value of plant -
height in 2007 year. Days to physiological maturity in 2006
.and days to flowering in both seasons**

Inoculation with Halex gave the maximum value for other - agronomic characters but the differences did not reach the .level of significance

III.a.3 Effect of the interaction between sowing dates X :biofertilization

April 15th plus inoculation with Halex delayed flowering - dates by about 10.25 days in comparison to the middle sowing date (May 15th) and late sowing date (June 15th) with .inoculated by biofertilizer in 2006

May 15th X inoculation recorded the highest number of - nodules 88.74. While, June 15th gave the minimum number of .nodules 76.44

:III.b.Yield and yield component

:III.b.1.Pods and straw yield

:III.b.1.1 Effect of sowing date

st sowing date (April 15th) appeared to be surpassed 2nd \ - sowing (May 15th) and 3rd (June 15th) in pos and straw yield

:III.b.1.2 Effect of biofertilization

Inoculation with halex increased significantly pods yield by - about 45% (1213.29 vs. 839.52kg) for inoculated and non-inoculated respectively

Inoculation was surpassed to straw yield non-inoculation by - about 12 % (2288.16 % vs. 2567.57kg) for the former and latter, respectively

III.b.1.3 Effect of the interaction between sowing dates X :biofertilization

April 15th plus inoculation with Halex had the highest pods - yield per faddan (1116.49gk). While, June 15th X non-inoculation had the lowest pods yield per faddan (620.95 kg

:III.b.2. Yield component

:III.b.2.1 Effect of biofertilization

Number of pods per plant was significant descending from - April 15th 28.02 and 33.39 to May15th 25.88 and 303.39 to June 15th 22.98 and 24.05 pod, for the first and second .season, respectively

April 15th gave the heaviest pods per plant (45.41 gm and - 556.46 gm), followed by May 15th (36.73 and 51.29 gm) then,

**June 15th (36.12 and 42.71gm) for the first and second
.seasons, respectively**

**Highest 100-seed weight resulted from April 15th 84.26 gm, -
followed by May 15th 75.68 gm then, June 15th 74.85 gm that
.was noticed as combined over year**

:III.b.2.2 Effect of biofertilization

**Inoculation with Halex gave the heaviest pods per plant (43.1 -
gm and 52.52 gm) for the first and second season,
respectively. While, non-inoculation with Halex had the
lowest values weight pods per plant (35.73 and 47.78 gm) in
.the first and second season, respectively**

**weight seeds descending from inoculation with Halex - \ , \ , -
(82.71 to 72.63 gm) for non-inoculation in 2007 year**

:III.c Quality characters

:III.c.1 Effect of sowing date

**Oil % decreased from April 15th (40.77 % and 44.99%) to -
May 15th (39.29 % and 43.19 %) to June 15th 37.95 % and
.40.13 % for the first and second seasons, respectively**

**Protein percentage decreased from April 15th (20.59 %) to -
.May 15th (18.49%) to June 15th (18.34 %) in 2006 season**

:III.c.2 Effect of biofertilization

**Inoculation with Halex superior to non-inoculation of oil -
percentage by about 10.5 (41.21 vs. 37.47 %) for inoculation
and non-inoculation respectively**