SUMMARY

Field experiments were carried out at the Agricultural Research and Experiment Station, Faculty of Agriculture at Moshtohor, Zagazig University in the two successive growing seasons of 1981 and 1982.

Soil analysis of the experimental plots indicated a clay soil texture, pH value of 7.9 and 2.54% organis matter content. Two studies were performed.

First Study

Growth and Yield of Maize as Affected by Methods of Planting and Thinning Dates:

This experiment aimed to study the effect of three planting methods and four thinning dates on the growth behaviour, quantitative and qualitative characters of maize plants.

The commercial distributed maize cultivar Pioneer 514 (a double hybrid) was used in this study. Nitrogen was applied at a rate of 90 kg/fd. Normal cultural practices were applied properly.

The experiment included 12 treatments which were the combination of three planting methods and four thinning dates.

A - Planting methods were: Wet planting (Herati), dry planting (Afir) and flat planting (Minimum tillage).

In all of the three planting methods maize was grown on ridged rows of 70 cm apart at 30 cm distance between hills where 4 kernels were planted per hill.

B - Thinning dates were at 15, 20, 25 and 30 days from planting.

This experiment in particular was designed as a split-plot with six replicates. Methods of planting were the main plots and thinning dates were randomly distributed in the sub-plots. The sub-plot area was 21 m^2.

The main results could be summarized as follows:

Effect of planting methods:

1. The effect of planting methods on root dry weight of maize plants was significant in the two studied seasons. Wet planting method produced the highest dry weight of roots, followed by dry planting, then the flat planting where the lowest dry weight of roots was produced.

2. Maize plants grown under wet planting method reached tasseling and silking earlier than those of dry and flat methods. However, the differences were not significant.

3. Plant height of maize plants was not significantly affected by planting methods. However, plants grown under flat method were somewhat shorter than for the wet and dry planting methods.

4. The effect of planting methods on the ear height was significant only in the first season, having the same trend in the second season. Highest ear height was obtained by using wet planting method.

5. Maize plants grown under wet method were significantly superior in stem diameter than those grown under flat method.

6. Area of the topmost ear leaf was not significantly affected by the various planting methods.

7. Wet and dry planting methods increased ear length significantly as compared with flat method in the first growing season, where the wet method produced the highest ear length. However, the difference was not significant in the second season.

8. Planting method did not exhibit any significant effect on the ear diameter as well as number of rows/ear in both of the cultivated seasons.

9. Wet planting method produced the highest number of kernels per ear followed by the dry and then flat planting method in the two seasons.

10. Wet planting method induced a slight increase in ear weight over dry and flat planting methods, but these increases were not significant in both seasons.

11. Planting method did not exhibit any significant effect on the number of ears per plant in both seasons.

12. There was no significant difference in the number of plants per plot at harvest as a result of using the various planting methods. However, wet planting method had the highest number of plants per plot as compared to dry and flat planting methods.

13. Plants grown under wet and dry planting methods exceeded the flat method in grain yield per plant in the two cultivated seasons. However, such increase was significant only in the second season.

14. Shelling percentage as well as 100-kernel weight were not significantly affected by the various planting methods.

15. Methods of planting did not significantly affect the grain yield. Grain yield in wet planting method exceeded that in the dry and flat methods by 7.1 and 10.6% in 1981 and by 3.8 and 8.3% in 1982 season, but differences failed to reach the level of significance.

II. Effect of various thinning dates:

1. Thinning date had a significant effect on the dry weight of roots. Early thinning produced the highest dry root weight per plant, while the late thinning produced the lowest dry weight.

2. Tasseling and silking were significantly affected by the different thinning dates in both seasons. Earlier tasseling and silking were obtained at the earlier thinning date (15 days from planting).

3. Early thinning increased plant height and ear position on the plant in both seasons. However, the increase in the ear position was not significant in the second season. Thinning at 15 and 30 days from planting produced the tallest and the shortest maize plant, respectively.

4. Early thinning (15 days from planting) significantly increased the stem diameter and leaf area as compared to late thinning (30 days from planting).

11. There was no appreciable effect obtained by different thinning dates on the number of plants per plot at harvesting. Whereas the highest number of plant per plot at harvesting was obtained by thinning either after 20 or 30 days from planting.

12. The early thinning gave the highest number of ears per plant, while the late thinning date gave the lowset number.

13. Thinning dates had a significant effect on 100-kernel weight in the two growing seasons. The early thinning (15 days from planting) produced higher 100-kernel weight, then the 100-kernel was decreased toward delaying thinning.

14. Thinning dates had a significant effect on the grain yield per feddan in both of the studied seasons. Early thinning (15 days from planting) outyielded all of the other later thinning dates (20, 25 and 30 days from planting) by 50, 326 and 580 kg/fed. in 1981 season, respectively, corresponding to 192, 466,and 748 kg/fed. in 1982 season.

III. Interaction effects:

The effect of the interaction between various planting methods and thinning dates for the studied growth characters and yield as well as yield components were not significant in the two growing seasons.

Second Study

Growth and Yield of Maize as Affected by Intensity and Time of Replanting:

This experiment was designed to determine how early and at what intensity of replanting the highest yield and the top quality of maize could be produced.

This study included sixteen treatments which were the combination of five replanting intensities (10, 20, 30, 40 and 50% of the complete, 100%, stand), and three treatments of replanting (no replanting; replanting at 8 and 16 days from planting) plus the control (100% stand). The previously mentioned treatments were layed out in a randomized complete block design with six replicates.

The main results for the original or the unmissed plants could be summarized as follows:

1. Earlier tasseling and silking were obtained at the lower plant density as compared to the control of 100% stand.

2. Both tasseling and silking were significantly affected by the various replanting intensities. Plants grown under 50% intensity of the stand and replanted to the control of 100% stand reached tasseling and silking

earlier than the lower replanting intensities of 10, 20, 30 and 40%.

3. Time of replanting significantly influenced tasseling and silking dates only in the second season, where the late replanting enhanced early flowering compared to early replanting, while treatments without replanting exceeded the late ones.

4. The increase in plant population density tended to decrease the average plant height and ear position.

5. Plant height and ear position increased by increasing the replanting intensities from 10 to 50%.

6. Plant height and ear position were affected by the various replanting dates. The average plant height and ear position became higher at late and without replanting as compared with the early replanting.

7. Thicker stem diameter were produced at the lower population densities of 50% stand.

8. Stem diameter was significantly affected by different replanting intensities. There was an increase in stem diameter as replanting intensities increased from 10 to 50% replanting intensity.

9. Replanting date had a significant effect on the average stem diameter. Late replanting at 16 days from

planting produced thicker stem diameters of the original plants than with the early replanting (8 days from planting).

10. There was a tendency for the ear leaf area to increase as the plant population density decreased.

11. Ear leaf area was significantly affected by the different replanting intensities. It was decreased with the decrease of the replanting intensities.

12. Time of replanting had a significant effect on the ear leaf area.

In general, there was a reduction in plant growth characters in case of heavy populated stands where plant height, ear position, stem diameter and ear leaf area were reduced.

13. Ear characters were greatly affected by different population densities. The highest quality of ears (ear length, diameter, number of kernels per ear and ear weight) were obtained at the lowest plant population density. Number of rows per ear was not affected by the different population densities.

14. Replanting intensities had a marked effect on the ear characters. Ear length and diameter, number of kernels per ear and ear weight were significantly increased by increasing the replanting intensities from 10 to 50%.

15. Late replanting (16 days from planting) increased ear length, diameter, and number of kernels per ear as compared to the early replanting (8 days from planting), while ear weight was not significantly affected by different replanting dates.

16. At the higher population density (100% stand), plants carried the lowest number of ears per plant, while the light population densities were associated with the highest number of ears per plant.

17. Number of ears per plant became higher as the replanting intensities increased from 10 to 50%.

18. Number of ears per plant at late replanting was significantly higher than the early replanting in the second season only. However, the same trend without any significant difference was obtained in the first season.

19. There was a general increase in grain yield per plant as the plant population densities decreased from 100 to 50% stand. Plants grown at the higher population densities (100% stand) produced the lowest grain yield per plant, while plants at the lower population (50% stand) were associated with the highest grain yield per plant in both seasons.

20. The highest grain yield per plant was produced as the replanting intensities increased to 50% .

Grain yield of early replanting in 1981 surpassed the unreplanted treatments by 506 (17%), 301 (9%), 112 (3%), 171 (5%) and 76 (2%) kg/fed. for 50, 40, 30, 20 and 10% replanting intensities, respectively. The corresponding increases in 1982 season for early replanting were 456 (14%), 233 (7%), 106 (3%), 52 (1.3%) and -62 (-1.5%) kg/fed., respectively.

29. Early replanting was only effective where a great reduction in the stand occurred (50 or 40%). However, late replanting was only effective where 50% of the original stand was skipped. Under 50% replanting intensity, late replanting resulted in a significant grain yield increase of 251 kg/fed (8.5%) in 1981 and 180 kg/fed. (5.7%) in 1982. While, differences in grain yield as a result of late replanting compared with unreplanted treatments were 64 (2%), -19 (-0.5%), 16 (0.5%) and -63 (-1.7%) kg/fed. for 40, 30, 20 and 10% replanting intensities, respectively in 1981, being -75 (-2%), -79 -(-2%), -115 (-3%) and -259 (-6.6%) kg/fed. in 1982 season.

30. Early replanting (after 8 days from planting) is recommended only if a severe loss in the stand occured. I_t proved to be beneficial only under 50 and 40% reduction in maize stand. Whereas, late replanting (after 16 days from planting) is beneficial only where 50% of the original plants are skipped. Moreover, late replanting may reduce grain yield of maize if the stand is 90 or 80% of complete (100) stand.