

Maize grain yield response to methods of planting and some related cultural treatments

Gaber Yehia Gelilah

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% organic matter content. Two studies were performed. -Growth and Yield of Maize as Affected by Methods of Planting and Thinning Date

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/ha. 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 m².

The main results could be summarized as follows:

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. 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.
2. 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.
3. 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.
4. Maize plants grown under wet method were significantly superior in stem diameter than those grown under flat method.
5. Area of the topmost ear leaf was not significantly affected by the various planting methods.
6. 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.
7. 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.
8. Wet planting method produced the highest number of kernels per ear followed by the dry and then flat planting method in the two seasons.
9. 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.
10. Planting method did not exhibit any significant effect on the number of ears per plant in both seasons.
11. 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.
12. 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.
13. 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. Tassel length 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).
5. The ear length and ear diameter increased significantly due to the early thinning as compared to the late thinning date.
6. The effect of various thinning dates on the number of rows per ear was not significant having no specific trend.
7. There were significant differences in the number of kernels per ear between the early and the late thinning dates.
8. Early thinning (15 days from planting) gave a significant increase in ear weight in the first and second seasons as compared with late thinning (30 days from planting).
9. Time of thinning had a significant effect on the grain yield per plant in the two cultivated seasons. The delay in thinning date (30 days from planting) caused a decrease in grain weight per plant by about 20.6% and 28.2% in 1981 and 1982 seasons, respectively as compared with the early thinning.
10. Shelling percentage was significantly affected by thinning dates only in the second growing season. The highest shelling percentage was produced by thinning at 15 days from planting in both seasons.
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 plants 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 lowest 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 effect: 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.