

SUMMARY

Two field experiments were conducted at the Research and Experiment Station of the Faculty of Agriculture, Moshtohor, during 1981 and 1982 seasons, to study the effect of sowing date, variety and seed rate on the growth and yield of forage sorghum (Sorghum bicolor (L.) Moench).

The soil of the experiments was clay textured with a pH value of 7.9 and an organic matter content of 2.51%.

Each experiment included 36 treatments which were the combination of four sowing dates, three varieties and three seeding rates.

Factors under study were:

1. Sowing dates: 17 th. May, 1 st June, 16 th June and 1 st July.
2. Varieties: Pioneer (988), Sordan (79) and Sudangrass (2).
3. Seeding rate: 10, 15 and 20 kg/fad.

The experiment was designed according to split-split plot design in four replication. Sowing dates were arranged at random in the main plots, the variety treatments were assigned at random within the sub-plot, while the seeding

rates were randomly distributed in the sub-sub-plots.

Results could be summarized as follows:

A. Effect of sowing date:

1. Sowing date showed significant effect on plant height and stem diameter of sorghum at different cuts in the two successive seasons. Plant height and stem diameter of sorghum plants significantly decreased with delaying sowing date.
2. Differences between sowing dates in number of stems/ m^2 , number of leaves/plant as well as LAI were significant in the two seasons. Early sowing of May 17th produced higher number of stems/ m^2 , number of leaves/plant and LAI as compared with other dates of sowing. On the other hand, the sowing at July 1st gave the highest leaf: stem ratio than the other planting dates.
3. Dry weight of plant organs was significantly affected by sowing dates in the both seasons. Dry weight of leaves, stems and whole plant decreased significantly as sowing date was delayed until July 1st.
4. Differences between sowing date in the yields of fresh dry as well as protein at each cut and total forage, yield were significant in the two seasons. There was a progressive and consistent depression in the yield of fresh, dry and protein with delaying the sowing date.

5. Sowing date had a significant effect on the chemical composition of sorghum plant. Delaying sowing date increased the protein as well as HCN% in the different plant organs of sorghum. On the other hand, the carbohydrate% in leaves, stems and whole plant decreased with delaying sowing date until July 1st

B. Effect of varieties:

1. Varieties exhibited significant effects on plant height of sorghum plant. Sudan (2) produced significantly higher plants than either Sordan (79) or Pioneer (988) in both seasons. Whereas, Pioneer (988) was significantly thicker than those of Sordan (79) and Sudan (2).
2. Number of stems/m², number of leaves/ plant, LAI and leaf: stem ratio differed significantly among genotypes at each cut in two seasons. Pioneer (988) surpassed significantly the other varieties.
3. Varieties exerted a marked effect on the dry weight of leaves, stems and whole plant at each cut in the two successive seasons. Pioneer (988) produced greatest dry weight plant, whereas Sudan (2) gave the lowest values at the two cuts in both seasons.

4. Varieties differed significantly in fresh yield, dry yield and protein yield at each cut as well as the total forage yield confirmed in both seasons. Pioneer (988) surpassed Sordan (79) and Sudan (2).
5. Varieties showed significant effect on chemical composition of sorghum plant. Pioneer (988) gave the highest percentage of protein as well as carbohydrate in leaves, stems and whole plant, whereas the lowest percentage was obtained from Sudan (2). With regard to HCN%, it is obvious that the HCN% of different plant organs was greater in Sordan(79) than the other two varieties.

C. Effect of seeding rate:

1. Seeding rate showed significant effect on plant height and stem diameter of sorghum plants at each cut in the two seasons. Increasing seed rate up to 20 kg/fad. increased plant height of sorghum. On the other hand, stem diameters decreased with increasing seed rate.
2. Number of stems/m² as well as LAI. and leaf: stem ratio increased with the increase in the seed rate up to 20 kg/fad. in the two seasons. On the other hand, increasing seeding rate from 10 to 20 kg/fad. decreased the number of leaves/plant.

3. Dry weight of plant organs was significantly influenced by seeding rates in the two seasons. Dry weight of leaves, stems and whole plant decreased with increasing seeding rate.
4. Seeding rate showed significant effect on yields of fresh, dry as well as protein at each cut and total forage yield in the two seasons. The forage yields increased with increasing seeding rate up to the highest level (20 kg/fad.).
5. Chemical composition of sorghum plants was significantly influenced by seeding rates. The percentage of protein in leaves, stems and whole plant decreased with the increase in the seed rate up to 20 kg/fad. in the two seasons. On the other hand, increasing seeding rate from 10 to 20 kg/fad. increased the percentage of carbohydrate as well as HCN in the different organs of sorghum plant.

D. Effect of the interaction:

1. The effect of the interaction (varieties X sowing dates) on dry weight of leaves/plant, forage fresh yield and carbohydrate content in leaves and stems was significantly at the 1st and 2nd cut only in 1982 season. The highest values resulted from sowing Pioneer (988) on May 17th.

while the lowest one was obtained from Sudan (2) sown on June 16 th , and July 1 st.

2. The effect of the interaction (sowing date X seeding rates) was significant on LAI in the two seasons and on protein yield in the first season. The highest protein yield was obtained from higher seeding rate (20 kg/fad.) at 2 nd . cut when sorghum plant sown early on May 17 th.
3. The effect of the interaction (varieties X seeding rates) was significant on the number of stems/m² and LAI in first season and on stem diameter, LAI and the carbohydrate percentage of stems in second season. In 1981 season, the highest number of stems/m² and LAI was obtained from Pioneer (988) and seeding rate 20 kg/fad. Whereas, the highest stem diameter was obtained from Pioneer (988) with the lowest seeding rate (10 kg/fad.).
4. The effect of the interaction (sowing dates X varieties X seeding rates) was significant on LAI and protein yield at the 1 st cut only in 1981 season. The highest values were obtained from Pioneer (988) when sown on May 17 th with the highest seeding rate (20 kg/fad.).