SUMMARY

Field experiments were carried out at the Research and Experiment Station , Faculty of Agriculture at Moshtohor , Zagazig University in the two successive seasons (1981/1982 and 1982/1983) to investigate the effect of soil application of various nitrogen levels, and various concentrations of different foliar micronutrients on the quantitative and qualitative characters of Egyptian clover and ryegrass mixture .

Soil analysis of the experimental plots indicated a clay soil texture with pH value of 7.5 .

Each experiment included fourty-eight treatments which were the combination of four soil nitrogen levels, (i.e. 0.0 , 30 , 60 and 90 kg N/fad) ; four micronutrients (Zn , Fe , Mn and Cu) and three concentrations each of these micronutrients (0 , 0.1 , 0.2 ; 0 , 0.2 , 0.4 ; 0 ; 0.2 , 0.4 and 0, 0.1 , 0.2 %) respectively .

The design of the experiment was split-split plot , with five replications . The four nitrogen levels were randomly arranged in the main plots , the four micronutrients were assigned randomly in the sub-plots , and their concentrations were devoted to the sub-sub plots. The area of the experimental unit was 10.5 sq.m.

Egyptian clover and Italian ryegrass were sown as a mixture using seed rate of 15 kg and 2.5 kg, respectively for obtaining a mixture forage stand of 75 % Egyptian clover and 25 % Italian ryegrass .

The main results could be summarized as follows :-

A - Forage yield :

(1) In general , applying either 30 or 60 kg N/fad could be enough to produce high forage yield over the majority of the individual cuts in the two growing seasons .

(2) The increase in the total forage yield of the mixture was greater by applying the first N level (30 kg N/fad) compared to the control . This increase in forage yield started to be slightly lower at the subsequent higher levels of N application .Applying 60 kg N/fad is the recommended rate for obtaining highly reasonable forage yield under the circumstances of these experiments .

(3) Foliar application of Mn , Zn , or Cu ; each had a pronounced effect in increasing the forage yield of the mixture. However, Mn ranked the first, followed by Zn then Cu for producing the highest forage yield of the majority of the individual cuts in the two growing seasons . Meanwhile Fe was the last in this rank. Either Zn or Cu at 0.1% concentration, and either Mn or Fe at 0.2% concentration produced the highest forage yield of most of the individual cuts and the total yield .

(4) No interaction effect of N levels and micronutrient treatments was found on the forage yield of the individual cuts or the total yield .

Combined analysis for the forage yield revealed that :

(5) Applying 60 kg N/fad could be the recommended rate for nitrogen application as far as the cuts and the total forage yield were concerned .

(6) Manganese produced the highest total forage yield, followed by Zn , then Cu followed by Fe with a significant difference between each of the previously mentioned micronutrients .

(7) Applying 0.2% Mn, 0.1% Zn , 0.1% Cu, and 0.2 % Fe produced the highest forage yield of each of the four cuts and the total yield as well, where the interaction between the applied micronutrients and their concentrations effects was significant in all cuts except for the second one .

B - Dry yield :

(8) Applying 60 kg N/fad could be the recommended N level for producing the highest dry yield of the different cuts and the total yield.

(9) Manganese had the highest effect in producing the top total yield, then Zn followed by Cu , then Fe , without significant differences between the first three micronutrients . Whereas, the difference

in the effect between the first and last one was significant.

(10) Manganese at 0.4% significantly produced the highest dry yield of all cuts of the two seasons compared with the control . That concentration produced the highest total dry yield . However , the other micronutrients , Zn , Cu and Fe at the first concentration level 0.1 , 0.1 and 0.2 % , respectively produced the highest yield of the cuts and the total yield as well where Zn followed Mn , then Cu followed by Fe in their effects .

Combined analysis for the dry yield revealed that :

(11) Applying 60 kg N/fad is recommended N level for producing the highest dry yield of the cuts and the total yield of the mixed stand as well .

(12) Manganese application at 60 kg N/fad could be suggested for practical and better production , where the interaction effect was significant . It is also observed that , either Cu or Fe produced the lowest dry yield of most cuts at almost all nitrogen application levels .

(13) Highest dry yield was produced by applying Mn , then Zn,followed by Cu , then Fe.

(14) Applying 0.4% Mn produced the highest dry yield in all cuts , and the total dry yield as well . However, 0.1% Zn , 0.2% Fe , and 0.1%

Cu significantly produced the highest dry yield of the cuts and the total yield .

C - Plant height :

(15) Increasing nitrogen application levels caused a continuous significant increase in the plant height of the two components of the mixed stand . However, Egyptian clover plants responded to nitrogen application levels up to 60 kg N/fad, and ryegrass plants up to 90 kg N/fad.

(16) Manganese was the most important micronutrient in producing the tallest ryegrass plants in the first three cuts of the two growing seasons . Whereas, the effect of the applied micronutrients on the height of Egyptian clover was fluctuating among cuts and growing seasons having no specific trend .

D - Leaf/stem ratio :

(17) Leaf/stem ratio of Egyptian clover was continuously and significantly increased by applying the subsequent increments of N levels (0 to 90 kg/fad) in the first and second cuts . Whereas, the third and fourth cuts were differently affected . Regarding the two studied cuts of ryegrass, there was a significant and continuous increase in leaf/stem ratio as the N application level increased from 0 to 90 kg/fad. This increase was significant in the third cut but not